

UNISYS

BTOS Multimode Terminal Program (MTP)

Operations Guide

Relative to
Release Level 5.0

March 1987

Priced Item

1188141

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Overview

Introduction

The *Multimode Terminal Program* (MTP) allows your workstation to be used as an intelligent terminal that can communicate with host computers. MTP provides text- and forms-based data entry, a large display memory, local text editing, and a variety of commands for controlling MTP operation. MTP uses the processing power of the workstation to access printers and disk files, and offers CCITT X.25 protocol for communication over public data networks (PDNs).

MTP can be configured by commands sent over a communications channel from the host computer or read from local disk files. These commands allow a systems analyst to develop custom MTP forms and operations for specific applications.

Documentation Overview

The *Multimode Terminal Program Operations Guide* provides descriptions of the MTP keyboard and screen and defines basic operating instructions.

The *Multimode Terminal Program (MTP), Programming Reference Manual* provides detailed information on controlling MTP functions and configuring MTP for specific applications. This manual is intended for users who write host computer programs for MTP applications and/or create special MTP configurations.

The "Multimode Terminal Program X.25 Communications" section of the *X.25 Gateway Operations and Programming Guide* describes MTP use of the X.25 Network Gateway for communication over PDNs.

Concepts

Display Memory

Data can be sent to MTP in the following ways:

- You can enter data from the MTP keyboard.
- The host computer can send data over the communications channel.
- MTP can read data from files.

MTP stores data for display in a large memory area, called display memory, which can contain over 65,000 characters of data. Its actual size depends on the amount of memory available on the workstation when MTP is activated.

Display Screen

MTP uses the workstation's screen to display both MTP status information and data from display memory.

The top four lines of the screen are called the *status frame* and contain status information. Status information includes the date and time, MTP's operational status, file and printer status, communications channel status, and status messages.

The remainder of the screen, the *window*, represents a portion of the data maintained in display memory. As you enter data, display memory moves through the window so the most current data are always visible. In addition, you can change the portion of display memory visible within the window to show any previously entered data.

MTP can display data in lines of 80 characters on all BTOS workstations. However, if your workstation has a 132-column mode, MTP can display data in lines of either 80 or 132 characters per line. If you try to select 132-column mode on a workstation without that capability, the display will remain in 80-column mode.

Display Types

MTP has two display types to present two different types of data: text display and format display.

Text Display

Text display presents display memory in a free-form manner. The data in display memory are contained on lines, much like type on a typed page.

Text display allows you to enter and/or edit data in display memory from the keyboard before sending the data or enter and/or edit data while sending the data to the host computer.

This display type is used for document preparation and text-based data entry; it supports high-level text editing capabilities available from the keyboard.

Format Display

Format display presents display memory in a fixed-format manner and restricts how and where data may be entered. The exact presentation of display memory is controlled by an application-specific form. Created by a systems analyst, a *form* is stored either at the host computer or on a file.

Format display arranges display memory into areas called *fields* according to the instructions contained in the form.

Protected fields are used to display preentered, constant information, and can be thought of as questions to be answered. You cannot enter data in protected fields.

Unprotected fields receive data and can be thought of as areas where you answer the questions contained in the protected fields. An unprotected field can have special restrictions on the type of data you can enter into it.

You can edit data in unprotected fields and move between these fields using the keyboard.

The host computer generally places forms in display memory, along with field locations, field definitions, and the restrictions on the data you enter. Data entered in unprotected fields can be checked against the restrictions by MTP or by the host computer.

Transmission Types

For sending data to a host computer, MTP supports block transmission and conversational transmission.

Block Transmission

In block transmission, each character is entered into display memory as you enter it, but is not sent to the host computer. You can edit data in display memory before sending it to the host computer. You can send to the host computer all display memory or use keyboard commands to select areas of display memory to be sent.

Two modes of block transmission are line mode and edit mode.

In *line mode*, MTP sends each line of display memory to the host computer after you finish entering and editing it. Line mode is intended for line-by-line interactions with the host computer.

In *edit mode*, display memory is sent to the host computer only when you explicitly command MTP to do so. You can select all or part of display memory for transmission. Edit mode is intended for applications requiring data to be extensively edited before being sent to the host computer.

Conversational Transmission

With conversational transmission, each character is sent to the host computer as you enter it. Conversational transmission is intended for applications where data is not edited. The two modes of conversational transmission are half-duplex mode and full-duplex mode.

In *half-duplex mode*, each character is entered into display memory as it is sent to the host computer.

In *full-duplex mode*, each character is sent to the host computer, but is not entered into display memory. The host computer must *echo* the character (return it over the communications channel) for it to be entered into display memory. The host computer determines if it will echo characters. If the host computer does not echo the character, the window of the screen is blank while you enter data through the keyboard.

Files

MTP can simultaneously access up to four workstation files for entering and sending data.

Data from an *input file* can be entered into display memory or can be sent directly to the host computer.

Data from display memory can be stored in an *output file*.

Data sent to MTP by the host computer can be stored in a *recording file*. Using a recording file does not affect other MTP operations.

Data from display memory can be sent to local printers, either directly or by the printer spooler. The *printer file* is the specification of the printer that is to print the data. The printer file can be any BTOS compatible printer or spooler byte stream or any conventional disk file.

Keyboard

MTP can use any BTOS workstation keyboard for entering and editing data and activating advanced operations. The functions assigned to the keys by MTP are specifically designed for terminal emulation and differ in many cases from keyboard functions used with other workstation programs.

Configurability

MTP can be configured for specific applications in one of two methods.

One method is the use of *command files*, which are files containing sequences of MTP commands that define the functions of programmable keyboard keys, select operational modes, or define application-specific forms.

The other method is by using the host computer's transmission of commands to MTP over the communications channel.

MTP contains a standard command file that configures MTP as a general purpose terminal. This command file can be altered, or special host computer programs can be written, for controlling MTP. (See the *Multimode Terminal Program (MTP), Programming Reference Manual*.)

Operational Procedures

Installing MTP

There is no special procedure for installing the Multimode Terminal Program. MTP is automatically installed when the X.25 Network Gateway is loaded from the distribution diskette. For further information on how the X.25 Network Gateway software is installed, refer to the *X.25 Gateway Operations and Programming Guide*.

Invoking MTP

To invoke MTP from the Executive, type **Multimode Terminal Program** (or as many letters as required to make the command unique; see the *Standard Software Operations Guide* for details) in the command field of the command form. Then press GO. MTP then presents you with a series of forms.

Initial Procedures and Forms

When you invoke MTP, it automatically reads an initial command file containing commands that configure MTP for your application. The basic MTP screen is displayed during this process with the message

READ - FROM - D I S K

displayed in Status Line 3. Once MTP has completed reading the initialization file, the message

Ready nnnn/mmmm

is displayed in Status Line 3. The number of the line containing the cursor in display memory is *nnnn*; the first line in display memory is *0000*. The total number of lines in display memory is *mmmm*. If 10/807 is displayed, for example, the cursor is on line 11 and display memory contains 807 lines.

Forms Displayed at Power-Up

When MTP becomes ready, the form shown in Figure 3-1 is displayed.

Figure 3-1 Form for Selecting a Transmission Mode and Type

```
*** SELECT MODE ***  
FILL IN THE FORM AND PRESS GO  
MODE (Full, Half, Edit, or Line) █
```

This form asks you to enter a single letter to choose the transmission mode you wish to use. Choosing the transmission mode automatically also chooses the transmission type to be used. (Full-duplex mode and half-duplex mode are both conversational type; edit mode and line mode are both block type; see Section 2, "Transmission Types" for further information.)

When you have filled in the form presented to you, press GO. The transmission mode and type you selected are now set by MTP.

MODE (Full, Half, Edit, or Line) is the transmission mode and type and must be one of the following:

- F* indicates Full-Duplex Mode, conversational type
- H* indicates Half-Duplex Mode, conversational type
- E* indicates Edit Mode, block type
- L* indicates Line Mode, block type

Beginning Communications

Once you have selected the transmission mode, MTP is completely powered up. You can begin communications with the host computer.

Using Advanced Operations

When you use an advanced operation that displays a form (the CODE-function operations and the HELP operation), display memory is cleared. Exercise care in using these operations to avoid inadvertent loss of data.

Several notes to remember when using advanced operations are described below.

Setting File Specifications

When you set an output, input, recording, or printer file specification, display memory is cleared. However, actually writing data to the output or printer file does not display a form, and hence, does not effect display memory.

Therefore, if you wish to send data from display memory to an output or printer file, you should set up the file specifications for the files you will be using before you enter the data into the display memory.

File Recording and Reading Files

When you start file recording or read data from an input file into display memory, display memory is cleared. You should always start file recording or read data from a file into display memory at a point in your application where the data are not important to you.

Establishing a Connection

When you establish a connection by initiating or accepting a call, display memory is cleared. Therefore, you cannot use data that you have placed in display memory while communicating with one host computer when you switch to communicate with another host computer.

One way to avoid this is to write data from display memory into a file before you establish a connection to a new host computer. Then, read the file into display memory once the connection has been established.

Changing Options

When you change the options for sending a break indication to the host computer or change the transmission type you are using, display memory is cleared. You should always change break options or transmission type at a point in your application where the data in display memory are not important to you.

Terminating MTP Session

To terminate an MTP session, press CODE-CANCEL. This resets MTP to its initial state. Display memory, format information (such as tabs and margins), and the programmable function keys (advanced operations) are cleared. Text display is selected. The communication parameters are reset to their initial state. Any host connection is dropped. If the HELP key is pressed, it is initialized to read in the initialization file [Sys]<sys>MTP-INI.

Exiting From MTP

To terminate MTP, press CODE-FINISH. You will be returned to the workstation software (usually the Executive).

MTP Keyboard

MTP was designed to use the standard workstation keyboards described in the "Keyboard Management" section of the *BTOS Reference Manual*. The functions assigned to the keys by MTP are specifically designed for terminal emulation and differ in many cases from keyboard functions used with other workstation programs.

Keys are used for three functions in operating MTP: data entry, display operations, and advanced operations. Each function uses a different set of keys. The SHIFT, CODE, and LOCK keys select between multiple meanings (for example, LOCK and SHIFT are used to select between capital and lowercase letters when used with the alphabetic keys). Figure 4-1 illustrates a typical BTOS workstation keyboard for use with MTP. Your keyboard, however, may have some keys in locations different from those shown in the example. For example, the arrow keys might be located to the left of the numeric keypad rather than above it. The function and use of the keys is still the same.

MTP keyboard functions are described further in the Section 7, "Text Display Operations," Section 8, "Format Display Operations," and Section 10, "Advanced Operations"

Data Entry Keys

Data entry keys (see Figure 4-2) consist of the standard typewriter keys and the numeric keypad. These keys are *typematic*, that is, they repeat when they are held down. (The frequency of the typematic repetition is established when the system is established at system build.)

Data entry keys are used to enter data for storing in display memory, sending to the host computer over the communications channel, or both storing and sending. What happens to the data depends on the type of transmission (conversational or block) and the type of display (text or format) in use when you enter data. (For more information on transmission types, see Section 2, "Transmission Types."

Note: *SHIFT-¢ does not function in MTP.*

Using the data entry keys is described for text display and format display in Section 7, "Text Display Operations" and Section 8, "Format Display Operations."

Figure 4-1 MTP Keyboard

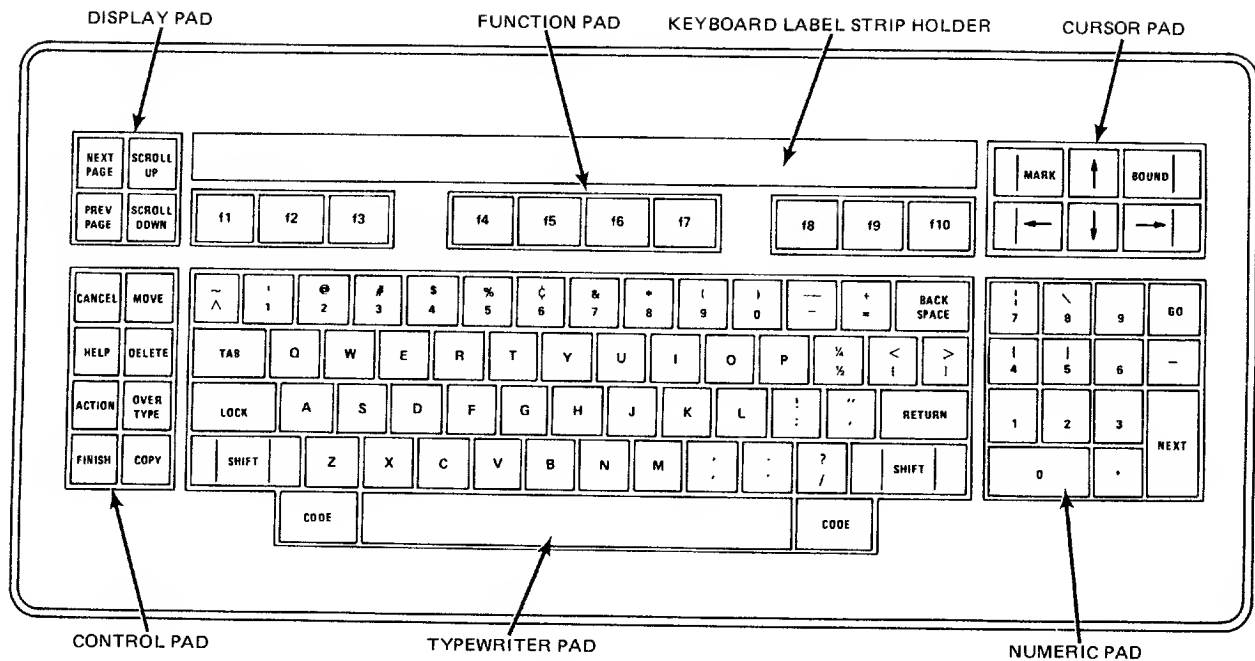
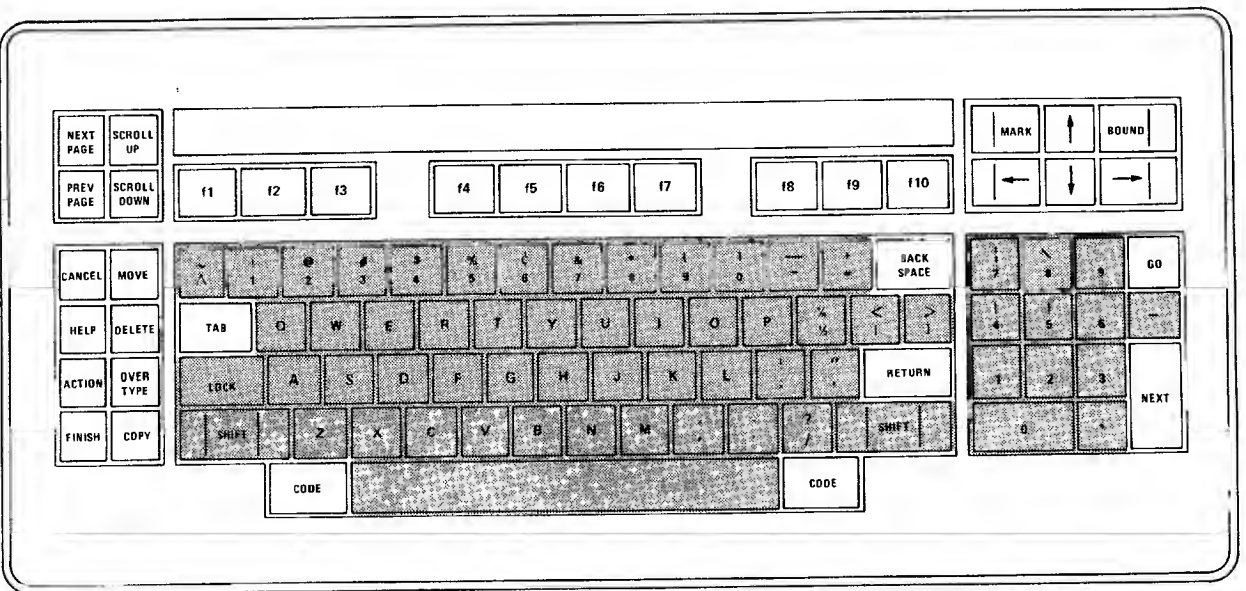


Figure 4-2 Data Entry Keys



Display Operation Keys

Display operation keys (see Figure 4-5) are used for editing data and for *scrolling* (moving) displayed data within the window. Some display operation keys (such as DELETE and BACKSPACE) are typematic, while others (such as MOVE and COPY) are not. The descriptions of the keys in the "Text Display Operations" and "Format Display Operations" sections contain this information.

In general, the display operation keys are used for local operations. That is, they are intended for sessions in which you edit your data before sending the data to the host computer. Usually, when you press these keys, you do not send data to the host computer. However, with some transmission types, these keys act as if they were data entry keys and send data to the host computer. In this case, it is up to the host computer to determine how these keys are used in the display operations.

Display operation keys and associated keys are described in the "Text Display Operations" and "Format Display Operations" sections.

Advanced Operation Keys

Advanced operation keys (see Figure 4-6) are used for operations specific to individual applications. These keys are not typematic.

Advanced operation keys are programmable. That is, they can be configured to perform functions such as placing data in display memory, controlling MTP with special commands to define forms, accessing files and printers, establishing communications channels and selecting types and modes for transmission and data display.

Advanced operations and associated keys are described in Section 10, "Advanced Operations."

Figure 4-3 Display Operation Keys

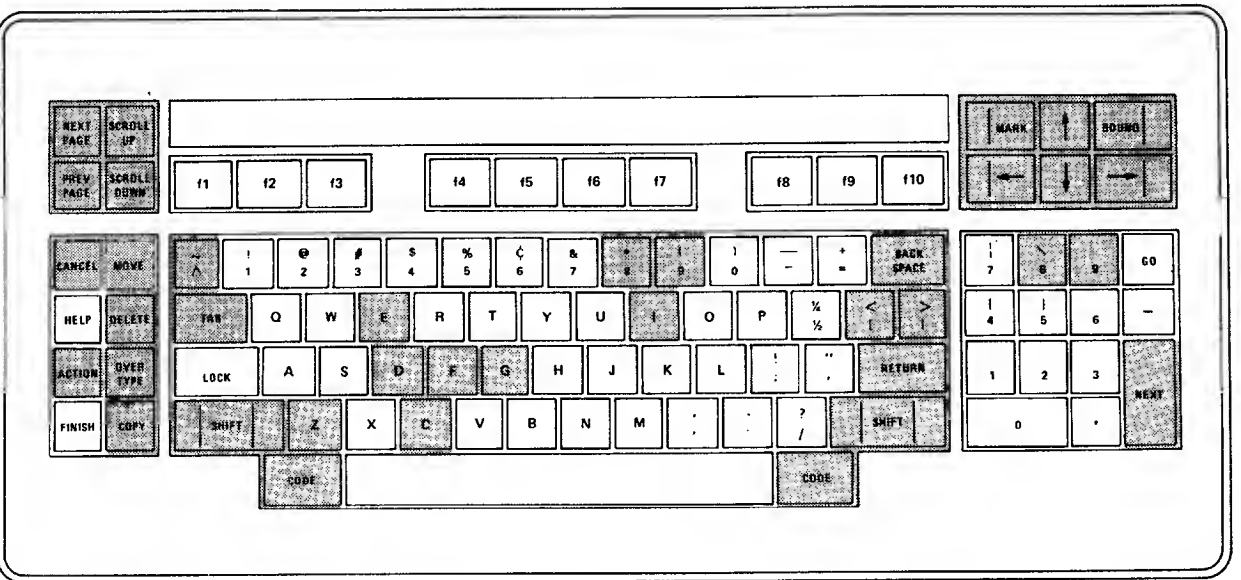
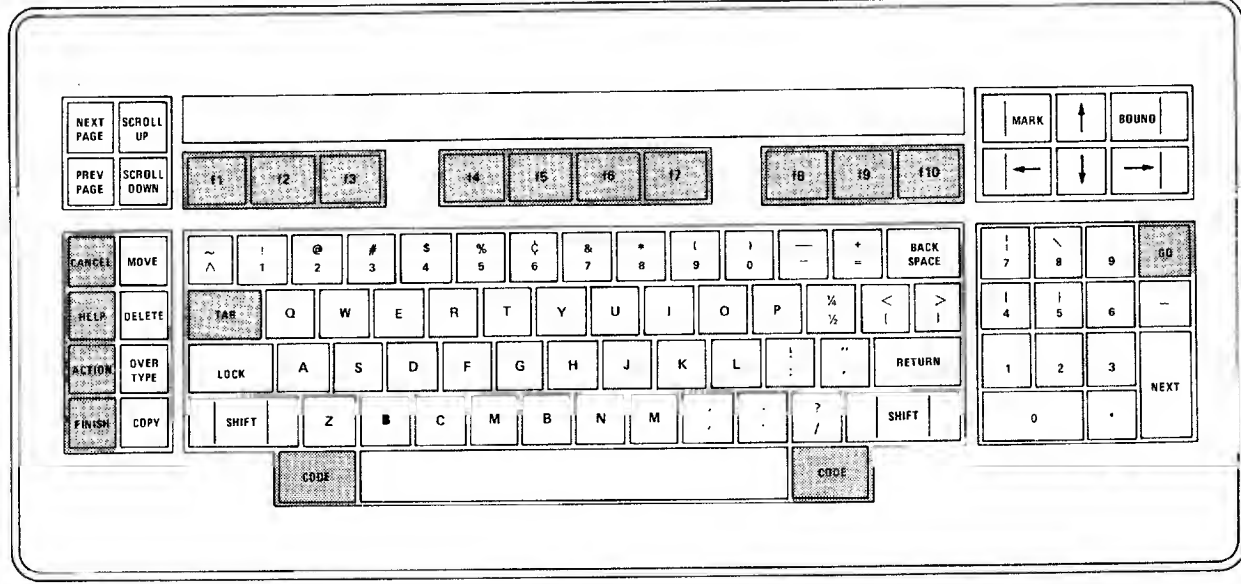


Figure 4-4 Advanced Operation Keys



Key Processing

Generally, MTP displays and /or sends input as soon as you enter it from the keyboard. However, if MTP is busy (for example, sending data to the host computer or executing complicated commands), a delay can occur while it processes your input. When MTP is busy, your input is stored by the workstation in a *type-ahead buffer* until it can be processed by MTP. (The size of the type-ahead buffer is usually 128 characters.)

If you enter too many characters into the typeahead buffer before MTP can process them, the excess characters are discarded. If this occurs, the message

BTOS ERROR CODE 610

is displayed in the status frame. (See the *BTOS Status Codes Reference Manual* for further information.)

Keyboard Lockout

The keyboard can be locked against receiving your input; this is referred to as keyboard lockout. The keyboard can be locked by a command from the host computer or a command file, or by MTP if it encounters a condition requiring your attention.

When keyboard lockout occurs, the keys do not respond to you, the workstation beeps, and the message

KEYBOARD - LOC KED

is displayed on line 3 of the status frame.

The MTP conditions that lock the keyboard are listed in Appendix A. When one of these conditions occur, MTP also displays an appropriate message in line 4 of the status frame.

The reasons for the host computer or a command file to lock your keyboard are specific to your application. If one of these conditions occurs, see the documentation for your application.

To unlock the keyboard and cancel any messages, press **CANCEL**. MTP will again accept keyboard input. If you press a key other than **CANCEL** while the keyboard is locked, the workstation beeps and ignores your action.

Display Memory and the Window

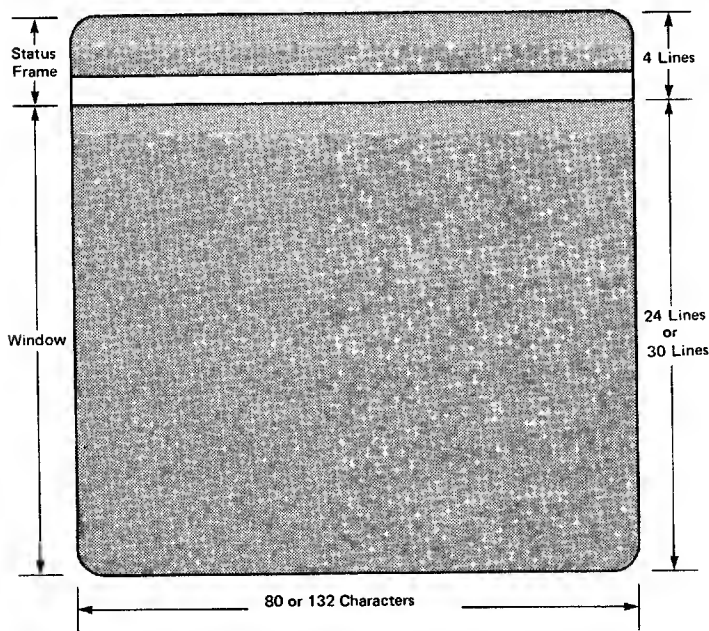
Display Memory

MTP retains data for display on the workstation screen in a large memory area called display memory. Display memory can contain more than 65,000 characters of data. The actual size depends on the amount of memory available within a workstation when MTP is accessed.

The Window

Only a portion of display memory can be shown on the workstation's screen. This visible portion of display memory is called the window. (See Figure 5-1.) The window is the space directly beneath the MTP *status frame*. The status frame, which is the top 4 lines of the screen, contains information about MTP status and messages from MTP or the host computer. (For further information, see the Section 11, "Status Frame.")

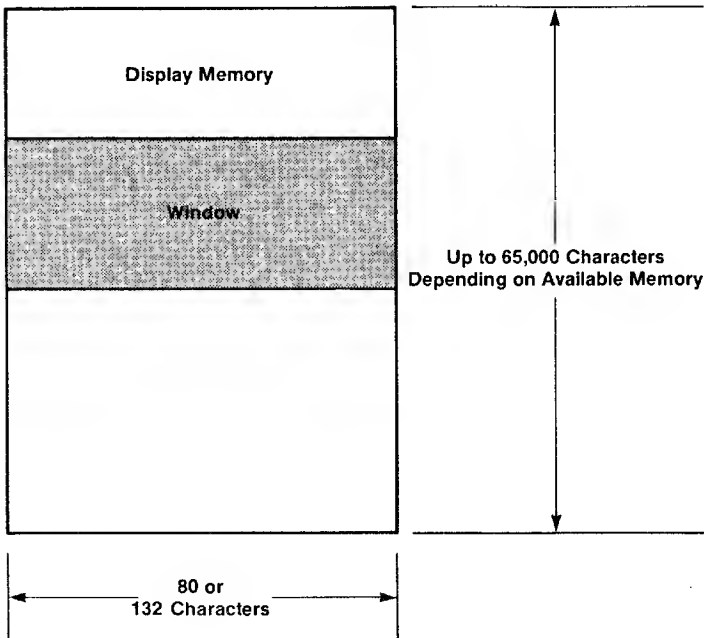
Figure 5-1 The Window on the MTP Screen



The *cursor*, which appears as a blinking underline, is always visible within the window. Data entered to MTP (by you, from files, or from the host computer) are placed in display memory at the position indicated by the cursor. The relationship of the window to display memory is shown in Figure 5-2.

Although only a small portion of display memory is visible in the window, you can change what is shown by moving the cursor. The portion of display memory shown in the window is scrolled (moved) up or down in order to keep the cursor visible. The MTP keyboard functions that control cursor movement are described in Section 7, "Text Display Operations" and Section 8, "Format Display Operations".

Figure 5-2 The Relationship of the Window to Display Memory



Filling Display Memory

If you enter enough data to fill display memory, or if display memory becomes full when data are being read from an input file, the message

Display memory full

is shown in the status frame. You cannot enter any more data until display memory has been cleared.

If display memory becomes full when data are being entered from the host computer, no message is displayed. The existing data in display memory are replaced with the new data in one of two ways.

If the cursor is located on the last character position in display memory, MTP clears the content of the first line of display memory and then moves display memory up one line. The new data are then placed in the last line of display memory (see Figure 5-3). MTP continues this process until there are no more data to enter.

If the cursor is located on any line except the last line in display memory, MTP writes the new data over the existing data, starting at the cursor's location. The cursor is moved to the most current character position of the new data. (See Figure 5-4.) MTP continues this process until the last line occurs, at which point MTP starts replacing data as described in the previous paragraph.

Clearing Display Memory

Display memory can be cleared from the keyboard by a command from a command file or a host computer, or by MTP itself. Clearing display memory is useful when its data are no longer useful or when display memory is full and you want to enter more data.

To clear display memory from the keyboard, see Section 7, "Text Display Operations" and Section 8, "Format Display Operations."

A command received from the host computer or a command file can clear display memory.

MTP clears display memory before performing the operations listed in Table 5-1. For information about avoiding inadvertent loss of data in display memory when performing these operations, see Section 3, "Operational Procedures."

Figure 5-3 Data Movement When the Cursor is on the Last Character Position of Display Memory

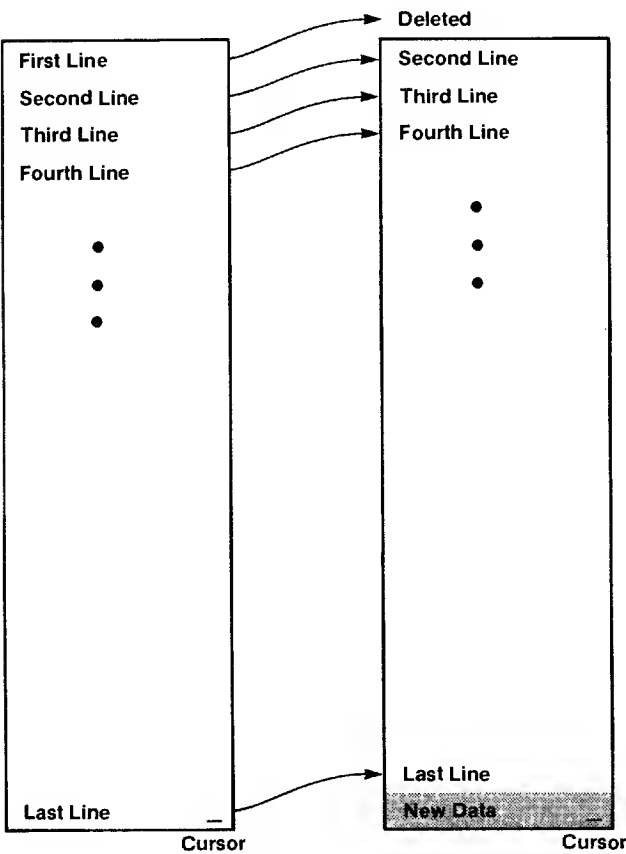


Figure 5-4 **Data Movement When the Cursor is not on the Last Line of Display Memory**

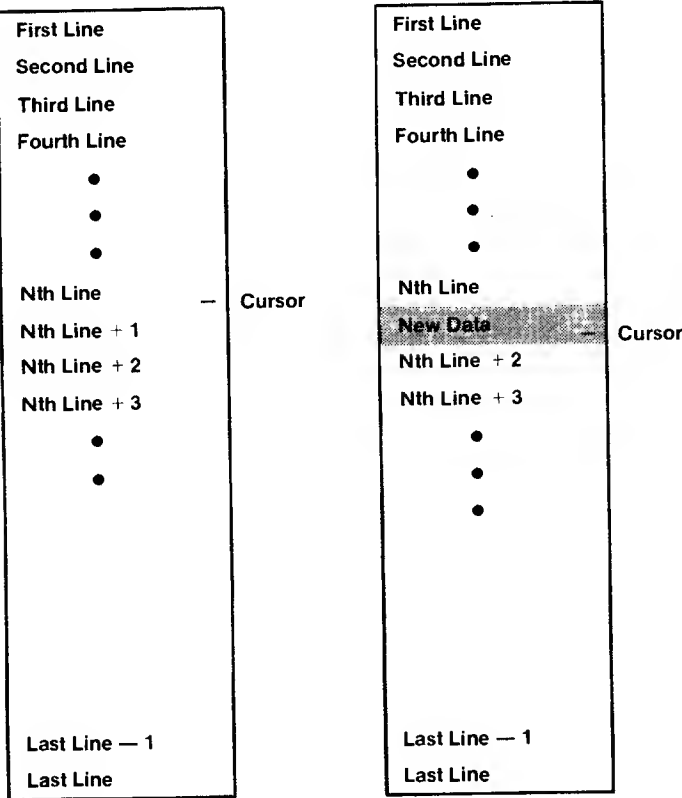


Table 5-1 **Operations that Clear Display Memory**

- Changing the display type
- Changing the width of the display line
- Displaying a form
- Reading a new command file
- Entering data in display memory from an input file

Display Types

MTP displays textual data in text display and forms data in format display. You can perform text editing from the keyboard on either type of data. However, certain keyboard operations behave differently depending on which display type MTP is in.

In general, you cannot select the display type through the keyboard. Whether your workstation is in text display or format display is controlled by a command file, certain advanced functions, or the host computer.

Text Display

Text Display presents display memory in a freeform manner with no restrictions on how and where you can enter data. The data in display memory are organized into lines, much like type on a typed page.

Text display allows you to enter and/or edit data in display memory from the keyboard before sending the data or while sending the data to the host computer. When data are sent depends upon the transmission type you selected. (See Section 9, "Transmission Types".)

This display type can be used for document preparation and text-based data entry. It supports high-level text editing capabilities of the keyboard.

Cursor Control

Data are placed in display memory at the cursor position shown in the window. Cursor control operations that are available from the keyboard allow you to enter data anywhere within display memory and to display any previously entered data. (See Section 7, "Text Display Operations.")

Margins and Tabs

When MTP is first activated, the *right margin* is set at the right edge of the screen (character position 80 or 132). The right margin is the last character position at which you can enter data. When the cursor reaches the right margin, it moves to the beginning of the next line. Changing the right margin only affects data entered after the change; previously entered data are not affected.

The *left margin* is permanently set at the left edge of the screen (character position 1); it cannot be changed.

When MTP is first activated, *tab stops* are set at character position 1 and then at every eighth character position on the line, that is, at 1, 9, 17, 25, 33, and so on. You can change these tab stops to fit your application.

The TAB key allows you to move the cursor to the next tab stop in the current line. MTP does not enter a tab character in the text. Instead, MTP enters spaces between the cursor's position and the tab stop as if you had pressed the space bar the required number of times. (MTP does this while moving the cursor.) Changing tab stops only affects data entered after the change; previously entered data are not affected.

Lines

A line is a series of characters ended with a *line terminator*. Line terminators are entered with the RETURN key from the keyboard, or by the host computer or command file.

When a line terminator is entered, the cursor is moved to the first character position of the next line. You can create a *blank line* by pressing RETURN without placing any characters on the line.

Word Wrap

When you enter more data than can fit on one screen line, the data are adjusted to fit on multiple screen lines for display. MTP uses word wrap to ensure that words are not split between lines. That is, when you are entering a word and the cursor reaches the right margin, the portion of the word already entered is moved to the next line, so the entire word is on a new line.

Insert and Overtyping Modes

When the cursor is positioned within an area of display memory containing previously entered text, you can use insert mode or overtype mode to define how new data will affect the existing display memory content.

In insert mode, characters are shifted at and to the right of the cursor position to make room for the new data being entered. If necessary, the data are shifted and readjusted with word wraps.

In overtype mode, new data replace existing data, character for character, beginning at the initial cursor position.

Editing

In text display, MTP allows for text editing commands from the keyboard and the ability to add new text with insert and overtype modes. Standard text editing commands include character and line delete, search, and search and replace.

In addition, you can use the MARK and BOUND keys to select an area of display memory for editing. This area is known as a *selection*. You can delete or sort the selection, or move or copy it to another position in display memory.

Format Display

Format display presents display memory in a fixed-format manner with restrictions on how and where you can enter data. The exact presentation of display memory is controlled by an application-specific form.

Format display is selected by the host computer from files, or with MTP advanced operations. (See Section 10, "Advanced Operations.") You cannot directly select format display except when using advanced operations.

Forms

Created by a systems analyst, a form is stored either at the host computer or in a file.

When presenting a form, format display arranges display memory into areas called *fields* according to the instruction contained in the form.

A form can contain up to 100 fields. Although these fields can be located anywhere within display memory, each field must fit on a single screen line and must not overlap another field.

The host computer generally places forms in display memory, along with field locations, field definitions, and the restrictions on the data you enter. Data entered in unprotected fields can be checked against the restrictions by MTP itself or by the host computer.

Note: TP clears the content of display memory each time a form is displayed.

Protected and Unprotected Fields

Protected fields display preentered, constant information and can be thought of as questions to be answered. You cannot enter data in protected fields. Also, any area of display memory that is not part of a field is considered blank and, therefore, protected.

Unprotected fields receive information and can be thought of as areas where you answer the questions contained in the protected fields. An unprotected field can have special restrictions on the type of data you can enter into it.

You can edit data entered in unprotected fields and move between these fields using the keyboard.

Attributes and Display Characteristics

Each field has an attribute that specifies its display characteristic, that is, how it is displayed on the screen. (For example, the reverse video attribute brightly highlights a field). These attributes are established by the form's designer. Attributes and corresponding display characteristics are shown in Table 6-1. A field can have more than one display characteristic.

The variety of display characteristics allows the form's designer to indicate groups of fields by using the same display characteristic for related fields or to emphasize important individual fields by using special display characteristics.

The form's designer also specifies an *input characteristic* for each field that specifies the type of, or the manner in which you enter, data in a field. If you enter incorrect data, an appropriate message appears in the status frame.

The input characteristics that a field can have are shown in Table 6-2. A field can have more than one input characteristic.

Table 6-1 Field Display Characteristics

Attribute Display	Characteristic
Blinking characters	Characters entered in the field will blink on the screen
Confidential data	Characters entered in the field are not displayed on the screen (this is useful for passwords and other data where security is required)
Half-bright reverse video	The field is highlighted on the screen
Reverse video	The field is brightly highlighted on the screen
Underline	The field is underlined on the screen

Table 6-2 Field Input Characteristics

Attribute	Input Characteristic
Alphabetic data	Enter only alphabetic data: A through Z, a through z, the hyphen (-), and the period (.)
Auto-exit	Automatically Exit a field when you reach the end
Left justify	Enter data in the field starting at the first (left-most) character position of the field
Look-up table	Enter data that compares to a list of entries defined by the form's designer (for example, YES or NO)
No blanks allowed	Completely fill the field with non-blank data
Numeric data	Enter only numeric data: 0 through 9, the hyphen (-), and the period (.)
Numeric range	Enter a number that matches one of a range of numbers defined by the form's designer (for example, 1 through 5)
Protected	Data cannot be entered in this field
Required field	Enter something in this field before you finish the form
Right justify	Enter data in the field so the data ends in the last (right-most) character position of the field

Field Verification

MTP can verify that the data you enter are valid according to the input characteristics (as specified by the form's designer). The verification takes place as each character of data is entered or as you leave the field.

Error Notification

If you enter data that violate a field's input characteristics (for example, entering numeric data in an alphabetic data field), the keyboard locks and an appropriate error message is displayed in the status frame. These error messages are described in Appendix A.

Other messages can be displayed by the host computer if it is verifying the data you enter. If you encounter a message not listed in Appendix A, see the documentation for your application for a description of the message.

To clear the message and unlock the keyboard, press CANCEL. If you press any other key while the keyboard is locked, the workstation beeps and your action is ignored.

Once the keyboard has been unlocked, you can reenter the data in the field.

Cursor Control

Data you enter are placed in the field in which the cursor is currently positioned. You can move the cursor between fields with keyboard commands. Cursor control operations and keys for format display are described in Section 8, "Format Display Operations."

Some operations move the cursor between unprotected fields; others allow the cursor to be moved anywhere within display memory. However, you can enter data only in unprotected fields.

If you move the cursor to a protected field or a protected area of the screen and attempt to enter data, the message

`Cursor is outside the field`

is displayed and the keyboard is locked. If this happens, press CANCEL and move the cursor to an unprotected field before you can enter data.

Tabs

Tab stops are automatically set at the beginning of each field. You can move between fields by pressing TAB, RETURN, or NEXT.

Some fields are known as *auto-exit* (automatic exit). MTP automatically exits an auto-exit field when you reach the end and moves the cursor to the beginning of the next field exactly as if you have pressed TAB, RETURN, or NEXT.

Insert and Overtyping Modes

When the cursor is positioned within an unprotected field containing previously entered data, you can use either insert mode or overtype mode to add new data.

In insert mode, characters at and to the right of the cursor position within the field are shifted to the right to make room for the new data being entered.

In overtype mode, new data replace existing data, character for character, beginning at the initial cursor position.

If you go past the end of the field in either mode, the following message is displayed:

Field full

Editing

MTP allows you to add new data in unprotected fields with insert and overtype modes. You can also delete individual characters within an unprotected field or delete its entire content.

Text Display Operations

In text display, four classes of operations are available from the keyboard:

- Cursor control
- Tab and margin
- Editing
- Management

For each class, a description of the operations is provided, followed by a listing of the keys used to perform these operations. Following this table is a more detailed description of each key and its associated operation. In some cases, a key combination (two keys held down simultaneously) is needed. In this manual, key combinations are cited as the individual keys separated by a hyphen (for example, CODE-MARK indicates that CODE and MARK are to be held down at the same time.

Cursor Control Operations

Cursor control operations (see Table 7-1 and Figure 7-1) allow you to move the cursor.

Moving the cursor vertically within the limits of the window does not affect the portion of display memory displayed in the window. If you move the cursor beyond the vertical limits of the window, MTP moves display memory within the window so that the line in which the cursor is located is always visible. Moving display memory within the window is known as scrolling.

You can move the cursor only within the limits of display memory. If you attempt to move the cursor above the first line or below the last line of display memory, the workstation beeps and the cursor does not move.

You can move the cursor horizontally within the limits of the screen line width (the left side of the screen and the right margin). If you attempt to move the cursor past the limits of the screen line (that is, move left from character position 1 or move beyond the right margin), the workstation beeps and the cursor does not move.

Table 7-1 **Cursor Control Operations in Text Display.**

Keys	Operations
↑	Moves the cursor up one line
↓	Moves the cursor down one line
←	Moves the cursor left one character position
→	Moves the cursor right one character position
Code-↑	Moves the cursor to the first character position of the first line in display memory (home position)
Code-↓	Moves the cursor to the first character position after the last nonblank character in display memory (home down position)
Code-←	Moves the cursor to the leftmost character of the current line (home left position)
Code-→	Moves the cursor to the first character position after the last nonblank character on the current line (home right position)
SCROLL UP	Scrolls display memory up one line in the window
SCROLL DOWN	Scrolls display memory down one line in the window
NEXT PAGE	Scrolls display memory down one full screen minus three lines so that the bottom three lines of the scrolled text are redisplayed as the top three lines of text of the new page.
PREV PAGE	Scrolls display memory up one full screen minus three lines so that the bottom three lines of the scrolled text are redisplayed as the top three lines of text of the new page.
RETURN or NEXT	Inserts a line terminator in the current line and moves the cursor to the first character position of the next line.

The following is a detailed description of each key or key combination and its function.

↑

Moves the cursor up one line without changing the cursor's horizontal position. If the cursor is at the top of the window, display memory is scrolled down one line. You can move the cursor until the top of display memory is reached. If the cursor is at the top of display memory, the workstation beeps and the cursor does not move.

↓

Moves the cursor down one line without changing the cursor's horizontal position. If the cursor is on the last line of the window, display memory is scrolled up one line. You can move the cursor until the bottom of display memory is reached. If the cursor is on the last line of display memory, the workstation beeps and the cursor does not move.

←

Moves the cursor one character position to the left. You can move the cursor until the first character position on the line is reached. If you try to move beyond the left margin, the workstation beeps and the cursor does not move.

→

Moves the cursor one character position to the right. You can move the cursor until the right margin is reached. If you try to move beyond the right margin, the workstation beeps and the cursor does not move.

CODE-↑

Moves the cursor to the first character position of the first line in display memory. This is referred to as the *home position*. This operation is useful when you want to return quickly to the start of the document.

CODE-↓

Moves the cursor to the last nonblank character position in display memory. This is referred to as the *home down position*. This operation is useful when you want to move quickly to the end of a document.

CODE-←

Moves the cursor to the leftmost character position (character position 1) of the current line. This is referred to as the *home left position*.

CODE- →

Moves the cursor right to one character position past the rightmost nonblank character position of the current line. If the entire line contains data, then the cursor is moved to the last character position of the line. This is referred to as the *home right position*.

SCROLL UP

Scrolls the display memory shown in the window up one line without changing the horizontal position of the cursor. As long as you press SCROLL UP, the cursor proceeds down through display memory until the last line in display memory is reached. If you try to move below the last line, the workstation beeps and the cursor does not move.

SCROLL DOWN

Scrolls the display memory shown in the window down one line without changing the horizontal position of the cursor. As long as you press scroll down, the cursor proceeds up through display memory until the first line of display memory is reached. If you try to move above the first line, the workstation beeps and the cursor does not move.

NEXT PAGE

Scrolls up the display memory shown in the window so that the bottom three lines of the scrolled text are redisplayed as the top three lines of the new page.

PREV PAGE

Scrolls down the display memory shown in the window so that the top three lines of the scrolled text are redisplayed as the bottom three lines of the new page.

RETURN or NEXT

Act interchangeably in text display. Each inserts a line terminator in the current line and moves the cursor to the first character position of the next line.

Tab and Margin Operations

The tab and margin operations (See Table 7-2 and Figure 7-2) allow you to set tab stops and the right margin. The left margin is always the first character position on a line (the leftmost character position displayed on the screen).

Table 7-2 **Tab and Margin Operations in Text Display**

Keys	Operations
TAB	Moves the cursor to the next tab stop
CODE-TAB	Moves the cursor to the previous tab stop
CODE-e	Sets a tab stop at the cursor position
CODE-f	clears the tab stop at the cursor position
CODE-g	clears all tab stops
CODE-i	sets the right margin at the cursor position

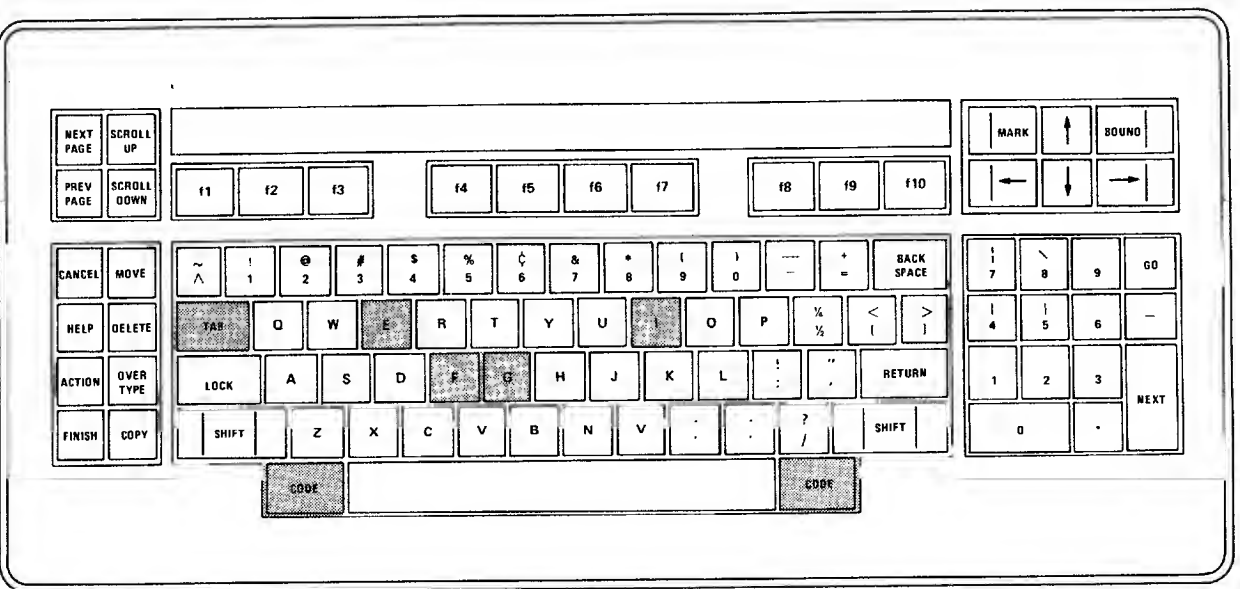
When MTP is first activated, tab stops are set at character position 1 and then at every eighth character position on the line, that is , at 1, 9, 17, 25, and so on.

You move the cursor to the next tab stop on the current line by pressing TAB. When you press TAB, MTP does not enter a tab character in display memory. Instead, MTP enters spaces between the cursor's position and the tab stop, as if you had pressed the space bar the required number of times.

The right margin is set at the right edge of the screen, that is, character position 80 for 80-character lines or character position 132 for 132-character lines.

While you can change the location of both tab stops and the right margin, doing so affects only data entered after a change. Previously entered data are not affected.

Figure 7-2 Tab and Margin Keys in Text Display.



The tab and margin keys function as follows:

TAB

Moves the cursor to the next tab stop. If no tabs exist between the cursor and the right margin, the cursor moves to the tab stop closest to the left margin of the next line.

CODE-TAB

Moves the cursor back to the previous tab stop. If tab stops are not set, the cursor moves to the tab stop closest to the right margin of the previous line.

CODE-e

Sets a tab stop at the cursor position. Only subsequently entered data are affected; previously entered data are not affected.

CODE-f

Removes the tab stop at the cursor position if a tab stop was previously set. Only subsequently entered data are affected; previously entered data are not affected.

CODE-g

Clears all tab stops within display memory. When all tabs are cleared, the cursor moves to the right margin. Only subsequently entered data are affected; previously entered data are not affected.

CODE-i

Sets the right margin at the cursor position. Only data received from the host computer can be entered past the right margin. Only subsequently entered data are affected; previously entered data are not affected.

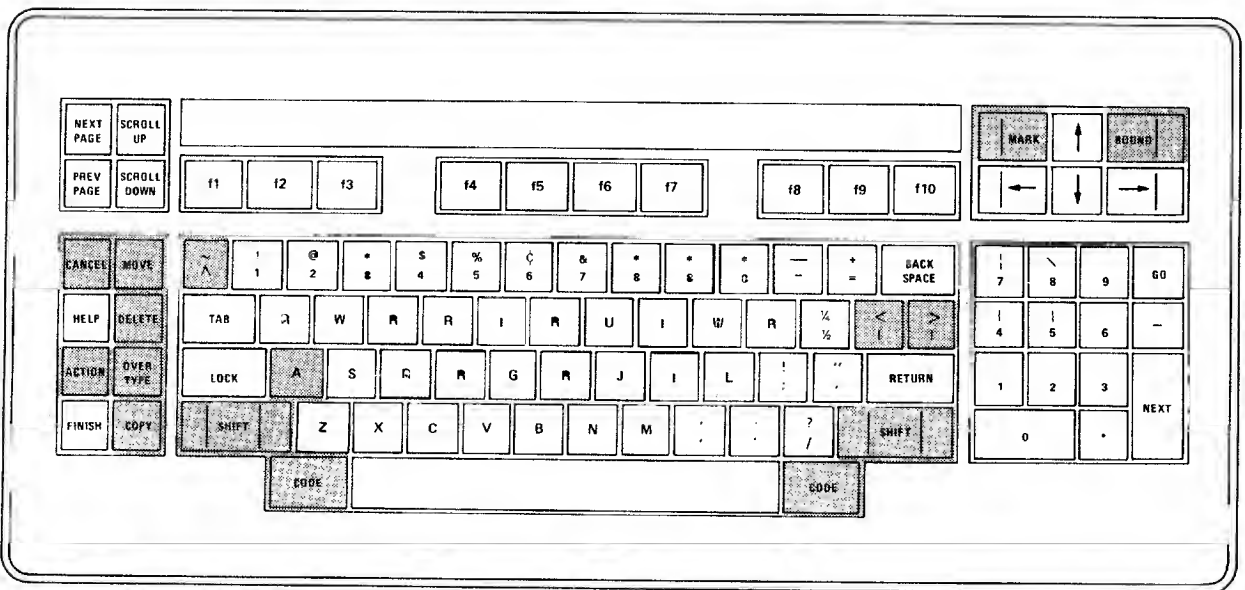
Editing Operations

Editing operations (See Table 7-3 and Figure 7-3) allow you to perform text editing functions from the keyboard as well as to add new data or replace existing text. Standard text-editing commands include character and line delete, search, and search and replace. In addition, you can select areas of display memory for deleting, or moving or copying to another position in display memory.

Table 7-3 Editing Operations in Text Display.

Keys	Operations
BACKSPACE	Deletes the character to the left of the current cursor position.
DELETE	Deletes the character at the current cursor position
SHIFT-DELETE	Deletes the line containing the current cursor position
OVERTYPE	Switches between insert and overtype modes
CODE-¶	Activates the search, search and replace, and print operations
MARK	Defines the starting position of a selection
BOUND	Defines the end position of a text selection
CODE-BOUND	Defines the end position of a column selection
CODE-DELETE	Deletes a selection
MOVE	Moves the data within the selection to the current cursor position
COPY	Copies the data within the selection to the current cursor position
CODE-]	Sorts the lines in ascending order according to the column selection
CODE-[Sorts the lines in descending order according to the column selection
CODE-MARK	Cancels a selection
ACTION	
-CANCEL	Cancels the operation in progress
CODE-a	Activates the literal mode

Figure 7-3 Editing Keys in Text Display.



The following is a detailed description of each key or key combination and its function.

BACKSPACE

Deletes the character to the left of the current cursor position. Characters at and to the right of the cursor position are shifted left along with the cursor. If the cursor is at the beginning of a line, BACKSPACE causes the cursor to move to the end of the previous line.

DELETE

Deletes the character at the current cursor position. Characters to the right of the cursor position are shifted left to replace the deleted character. If the line wraps around to the next line terminator (i.e., the line wraps around to the next line) and there is enough room, a word from the next line is moved up.

SHIFT-DELETE

Deletes the entire line containing the cursor position. Lines below the current cursor position are moved up to replace the deleted line.

OVERTYPE

Switches between insert and overtype modes when you are entering data. The OVERTYPE LED is off when insert mode is selected and on when overtype mode is selected.

Insert Mode. In insert mode, the new data are inserted before the cursor position. Characters on the line at and to the right of the cursor position are shifted to the right to make room for the new characters being entered. Except for being shifted, text is not affected by the insert mode. (The overtype mode is used to change existing text.)

Overtime Mode. In overtime mode, new data replace existing characters, character for character, with new characters beginning at the cursor position. (The insert mode is used to enter new data without affecting existing text.)

CODE-^

Activates the search, search and replace, and print operations. To activate one of these operations, press CODE-^ , type the name of the desired function and its parameters, and then press RETURN.

Search Operation. The search operation locates a specific spot in display memory by searching for a designated series of characters, called a *text string*. The search operation searches for a match of the text string, starting from the current cursor position. You can search for the first occurrence of the text string or for a specified number of occurrences. The search operation locates the text even if it is wrapped around the end of a line.

When the text string is found, it is highlighted on the screen and the scrolling movement pauses. Press RETURN to start the search for the next occurrence of the text string.

If the specified text string does not exist or if the last occurrence has been passed , the following message is displayed in the status frame:

Text string not found

The format of the search operation is

CODE-^ *n* F "text string" RETURN

where *n* is an optional parameter that specifies how many occurrences of the source text you want replaced. The number of occurrences is limited only by the number of characters in display memory. If you want to replace only the first occurrence, omit this parameter.

The **text string** is the string of characters you want to find. The length of this string is limited only by the length of the line. You can include any alphabetic, numeric, or punctuation character, except the quotation mark character ('), in the text string.

Search and Replace Operation. The search and replace operation searches for a specified text string. When it finds that text string, it replaces the existing (source) text string with the specified (replacement) text string. The search and replace operation searches for a match of the source text string from the current cursor position. The operation replaces either the first occurrence of the source text string or a specified number of occurrences.

When the search and replace operation locates a match, the message

Press GO to replace, CANCEL to skip item,
ACTION-CANCEL to finish operation.

is displayed in the status frame. The operation waits until you press GO, CANCEL, or ACTION-CANCEL. If you press any other key, the workstation beeps and ignores your action.

***Note:** In release 6.0 of MTP only, pressing CANCEL finishes the operation instead of skipping to the next item. In versions above 6.0, CANCEL operates as indicated in the status frame message.*

The format of the search and replace operation is

CODE-^ n S "source" "replacement" RETURN

where *n* is an optional parameter that specifies how many occurrences of the source text you want replaced. The number of occurrences is limited only by the number of characters in display memory. If you want to replace only the first occurrence, omit this parameter.

The "source" is the text string in display memory that you want replaced.

The "replacement" is the new text string.

The "source" and "replacement" parameters can be of any length as long as their combined lengths do not exceed the length of the line. You can include any data entry character, except the quotation mark character ("), in either parameter.

Print Operation. The print operation allows you to print a selection of display memory. The print operation sends what you want printed to the current printer file specification setup either by the initial command file or by a file operation. You can print any number of copies.

The format for the print operation is

CODE-^ n P RETURN

where *n* is an optional parameter that specifies how many times you want the selected text to be printed. If you want to print the selection only once, omit this parameter.

MARK

Defines the starting position of a selection or column selection from the current cursor position. The marked area, referred to as a selection, is highlighted. You can send, delete, move, copy, sort, or print the selection.

You end a text selection by moving the cursor to the end of the selection and pressing BOUND. You end a column selection by moving the cursor to the end of the selection and pressing CODE-BOUND. (If you do not end the selection with one of these two and you perform an operation other than scrolling, MTP automatically assumes you want a text selection and ends it at the end of the line where you began the selection.)

BOUND

Ends a text selection.

CODE-BOUND

Ends a column selection. The cursor position must be to the right and at least one line down from the beginning of the selection, so the selection forms a rectangle.

CODE-DELETE

Deletes a selection. The resulting blank space is replaced by the lines of the text to the right and below the deleted text selection or the text to the right of the deleted column selection.

MOVE

Moves the data within the selection to the current cursor position.

Text Selection. The text selection operation moves the selection to the current cursor position. You can move only to position below the text selection.

Column Selection. The column selection operation moves the selection right or left of the column position defined by the cursor's current horizontal position. You can move a column selection only horizontally, not vertically.

COPY

Copies both text and column selections.

Text Selection. The text selection operation copies the selection to the current cursor position. You can copy only to positions below the text selection.

Column Selection. The column selection operation copies the selection right or left to the column position defined by the cursor's current horizontal position. You can copy a column selection only horizontally, not vertically.

CODE-]

Sorts the lines in ascending order according to the column selection. (See "Sorting Column Selections".)

CODE-[

Sorts the lines in descending order according to the column selection. (See "Sorting Column Selections".)

CODE-MARK

Cancels the current selection. The content of display memory is not affected.

ACTION-CANCEL

Cancels an operation in progress (such as a search operation).

CODE-a

Activates *literal mode*. When you choose literal mode, MTP accepts the next character (and *only* the next character) you type literally and does not perform any action with it. This mode is useful if you use a MTP to create command files.

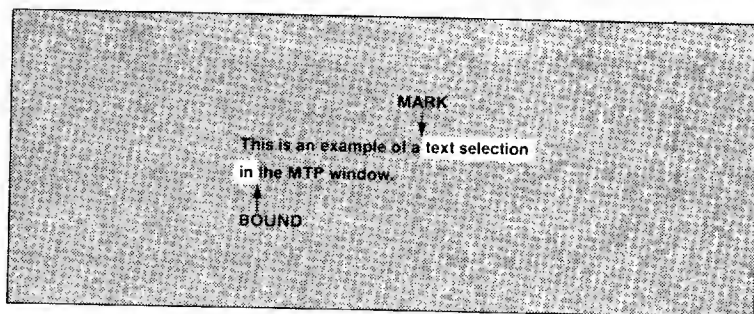
Selections

A selection is an area of display memory that you identify for use in deleting, moving, copying, or sorting operations. You make a selection using a combination of MARK, BOUND, and CODE keys.

Text Selection

To make a text selection, move the cursor to the first character position of the area you wish to identify. Press MARK. Then, move the cursor to the last character position of the area and press BOUND. A text selection includes all data between the display memory position where you pressed MARK and the position where you pressed BOUND. A text selection is highlighted in the window. (See Figure 7-4.)

Figure 7-4 Text Selection



After making a selection, you can delete the data within by pressing CODE-DELETE, or move or copy the data to another position in display memory by pressing MOVE, or COPY, respectively.

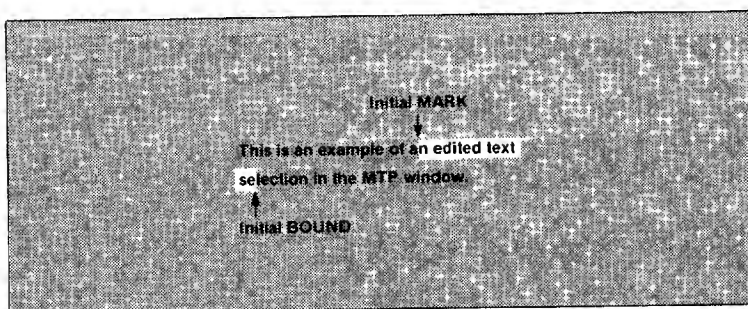
When you delete or move a selection, it and the highlight disappear from the screen. When you copy a selection, both the selection and the highlight remain in effect so you can copy the selection several times without reselecting it.

While a selection is in effect, you can change the ending position without changing the starting position simply by moving the cursor to a new position in display memory and pressing BOUND.

You can cancel the selection at any time by pressing CODE-MARK or by starting a new selection. Each new selection you create replaces the old selection. You can have only one selection at a time.

A selection is associated with the area of display memory that is highlighted, not with the data contained within that area. Thus, if you edit the data in a selection either by adding or deleting, the selection does not change in size although the data it contains changes. (See Figure 7-5.)

Figure 7-5 Edited Text Selection Before Resetting BOUND



Column Selection

A text selection, as describes above, includes all text between the start and end of the selection. You can also make a *column selection*, which includes the data within a rectangular area of display memory defined by the start and end of the selection. (See Figure 7-6.)

Figure 7-6 Column Selection

London	Stockwell Ltd.	\$100,555	\$1,418
New York	Hoffax and Sons Inc.	300,456	3,076
Sydney	Greene and Grahame	3,789	892
Brazilia	Brazilian Mercantile	467	432
Total		\$405,267	\$5,816

You begin a column selection in the same way as a text selection, by pressing MARK. However, you press CODE-BOUND, instead of just BOUND, to end the selection.

You can edit, delete, move, or copy a column selection in the same manner as described above for a text selection, except you can only move or copy the column selection horizontally. In addition, you can sort a column selection as described below.

Sorting Column Selections. *Sort operations* allow you to sort column selection. The sort operation reformat the lines of text according to the sequence of the characters that make up the column selection. For example, assume display memory contains :

```
0011      This is line 1.  
0002      This is line 2.  
0018      This is line 3.  
0001      This is line 4.
```

and the column selection is the first four characters of each of the three lines. Then the ascending sort operation would reformat display memory as follows:

```
0001      This is line 4.  
0002      This is line 2.  
0011      This is line 1.  
0018      This is line 3.
```

Management Operations

Management operations (See Table 7-4 and Figure 7-7) allow you to clear the keyboard lock condition, clear display memory, change the width of the display line, activate or terminate printer logging, perform resets, and enter the escape character into display memory.

Figure 7-7 Text Display Management Keys

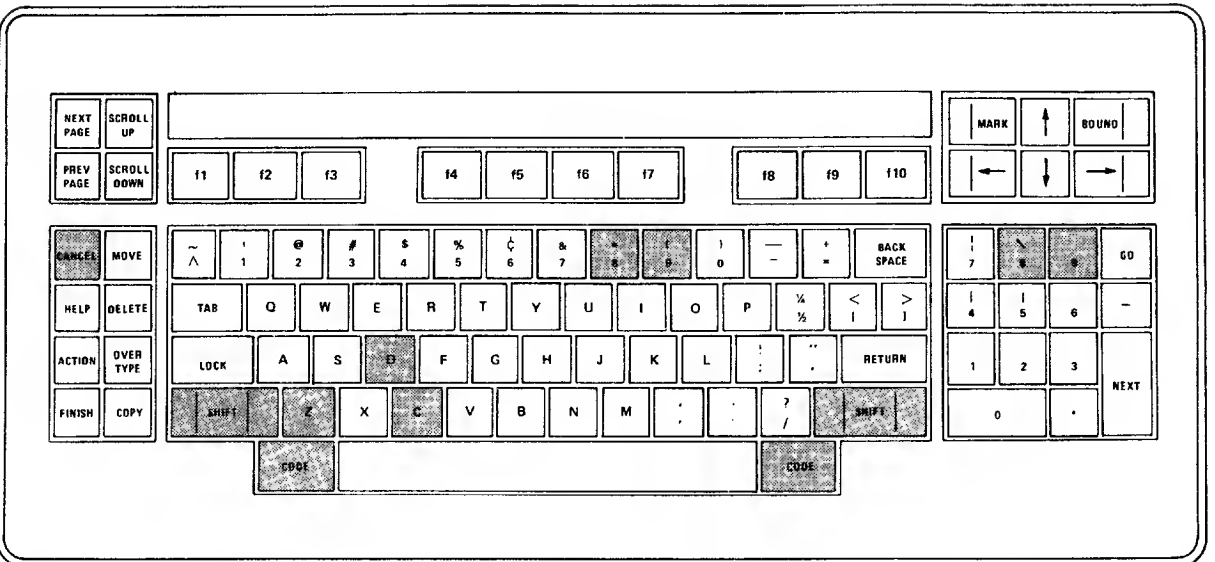


Table 7-4 **Management Operation in Text Display.**

Keys	Operations
CANCEL	Clears the keyboard lock condition and clears the message in the status frame
CODE-d	Clears display memory
CODE-z	Switches the screen line width between 80 and 132 character positions (workstations with 80 or 130 column capability only).
CODE-8	Turns on printer logging
CODE-9	Turns off printer logging
SHIFT-CANCEL	Resets communications
CODE-CANCEL	Resets MTP
CODE-c	Enters the escape character from the keyboard

The following is a detailed description of each key or key combination and its function.

CANCEL

Clears the keyboard lockout condition and any messages displayed in the status frame. If you press any other key when the keyboard is locked, the workstation beeps and ignores your action.

CODE-d

Clears the content of display memory. The cursor moves to the first character position of the first line in display memory (home position). Any selection is also canceled.

CODE-z

Switches the width of the screen line between 80 and 132 character positions (workstations with 80- or 132-column capability only).

***Note:** Changing the width of the display line clears display memory.*

CODE-8

Turns on the printer logging option. Printer logging directs data characters received from the host computer to the printer as well as to display memory.

CODE-9

Turns off printer logging.

SHIFT-CANCEL

Causes a communications reset to be performed. Printer logging, file recording, hexadecimal display, and monitoring are turned off. Text display is selected.

CODE-CANCEL

Resets MTP to its initial state. Display memory, format information (such as tabs and margins), and the programmable function keys (advanced operations) are cleared. The current communications option is also cleared.

Press HELP to restart MTP.

CODE-c

Enters the escape character (ASCII code 1Bh) from the keyboard. This character is useful for creating MTP command files.

Format Display Operations

In format display, three classes of operations are available from the keyboard:

- Cursor control and tabs
- Edition
- Management.

For each class, a description of the operations is provided, followed by a table listing the keys used to perform these operations. Following this table is a more detailed description of each key and its associated operation. In some cases, a key combination (several keys held down simultaneously) is needed. In this manual, key combinations are cited as the individual keys separated by a hyphen (for example, SHIFT-DELETE indicates that SHIFT and DELETE are to be held down at the same time).

Cursor Control and Tab Operations

Cursor control and tab operations (See Table 8-1 and Figure 8-1) allow you to move the cursor within the window. Some operations move the cursor between unprotected fields, others allow the cursor to be moved anywhere within display memory.

You can enter data only in unprotected fields. If you move the cursor outside of an unprotected field to a protected area of the screen and try to enter data, the message

`Cursor is outside the field`

is displayed in the status frame and the keyboard is locked. You must press CANCEL to unlock the keyboard. If you press any other key, the workstation beeps and ignores your action.

Once you have unlocked the keyboard, move the cursor to an unprotected field to enter data.

Figure 8-1 Cursor Control and Tab Keys in Format Display.

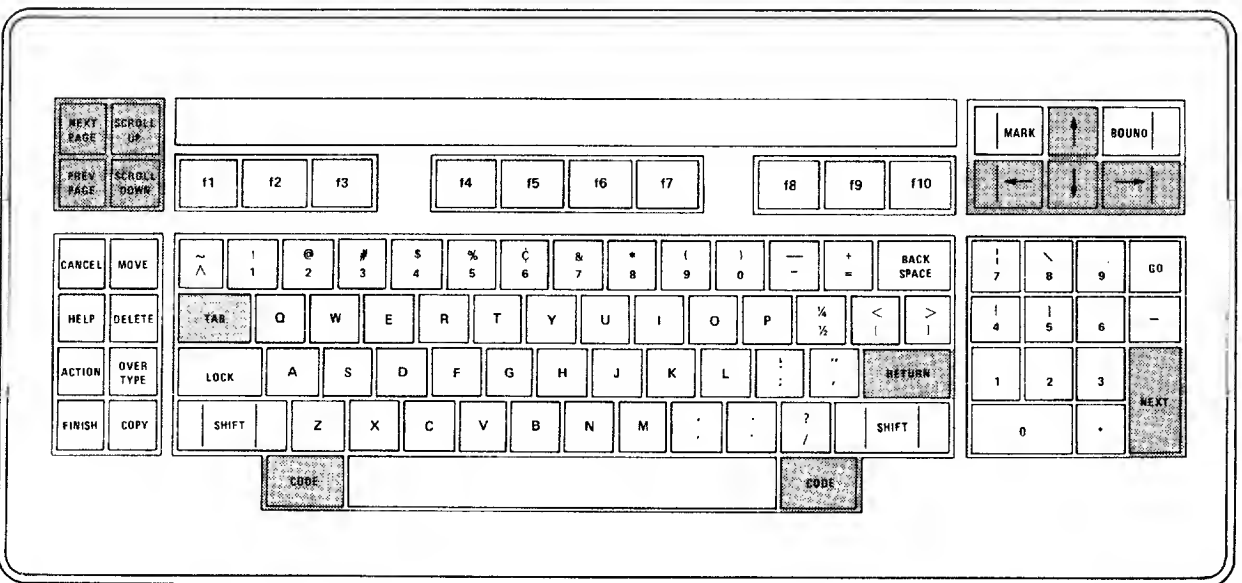


Table 8-1 Cursor Control and Tab Operations in Format Display

Keys	Operations
↑	Moves the cursor up one line
↓	Moves the cursor down one line
←	Moves the cursor left one character position
→	Moves the cursor right one character position
CODE-↑	Moves the cursor to the first character position of the first field in the form
CODE-↓	Moves the cursor to the first unprotected field below the current cursor position
CODE-←	Moves the cursor to the first character position after the last non blank character in the current field
CODE-→	Moves the cursor to the first character position after the last nonblank character in the current field
SCROLL UP	Scrolls display memory up one line in the window
SCROLL DOWN	Scrolls display memory down one line in the window
NEXT PAGE	Scrolls display memory down one full screen minus three lines so that the bottom three lines of the scrolled text are redisplayed as the top three lines of the new page.
PREV PAGE	Scrolls display memory up one full screen minus three lines so that the bottom three lines of the scrolled text are redisplayed as the top three lines of the new page.
RETURN, NEXT, or TAB	Exits the current field and moves the cursor to the first character position of the next field

The following is a detailed description of each key or key combination and its function.

↑

Moves the cursor up one line without changing the horizontal position of the cursor. If the cursor is at the top of the window, display memory is scrolled down one line. You can move the cursor until the top of display memory is reached. If the cursor is at the top of display memory, the workstation beeps and the cursor does not move.

↓

Moves the cursor down one line without changing the cursor's horizontal position. If the cursor is on the last line of display memory, the workstation beeps and the cursor does not move.

←

Moves the cursor one character position to the left. You can move the cursor until the first character position on the line is reached. If you try to move beyond the left margin, the workstation beeps and the cursor does not move.

→

Moves the cursor one character position to the right. You can move the cursor until the right margin is reached. If you try to move beyond the right margin, the workstation beeps and the cursor does not move.

CODE-↑

Moves the cursor to the first character position of the first field in the form. This operation is useful when you want to return quickly to the start of the form.

CODE-↓

Moves the cursor to the first unprotected field below the current cursor position.

CODE-←

Moves the cursor left to the first position of the current field.

CODE-→

Moves the cursor right to one character position past the rightmost non-blank character position of the current field. If the field is completely filled, then the cursor is moved to the last position of the field.

SCROLL UP

Scrolls the display memory shown in the window up one line without changing the horizontal position of the cursor. As long as you press SCROLL UP, the cursor proceeds down through display memory until the last line in display memory is reached. If you try to move below the last line, the workstation beeps and the cursor does not move.

SCROLL DOWN

Scrolls the display memory shown in the window down one line without changing the horizontal position of the cursor. As long as you press SCROLL DOWN, the cursor proceeds up through display memory until the first line of display memory is reached. If you try to move above the first line, the workstation beeps and the cursor does not move.

NEXT PAGE

Scrolls up the display memory shown in the window so that the bottom three lines of the scrolled text are redisplayed as the top three lines of the new page.

PREV PAGE

Scrolls down the display memory shown in the window so that the top three lines of the scrolled text are redisplayed as the bottom three lines of the new page.

RETURN, NEXT, or TAB

Act interchangeably in format display. Each moves the cursor to the first character position of the next unprotected field of the form. If the cursor is in the last field of the form, it is moved to the first character position of the first field of the form.

Some fields may be defined by the form's designer as *auto-exit* fields. When you enter data into the last character position of auto-exit fields, the cursor automatically moves to the first character position of the next unprotected field of the form, exactly as if you had pressed RETURN, NEXT or TAB.

Editing Operations

Editing operations (See Table 8-2 and Figure 8-2) from the keyboard allow you to add new text with insert and overwrite modes. In addition, you can delete individual characters within an unprotected field, the content of an unprotected field, to the content of all unprotected fields

Table 8-2 Editing Operations in Format Display

Keys	Operations
BACKSPACE	Deletes the character to the left of the current cursor position
DELETE	Deletes the character at the current cursor position
SHIFT-DELETE	Deletes the content of the field containing the current cursor position
OVERTYPE	Switches between insert and overwrite modes

The following is a detailed description of each key or key combination and its function.

BACKSPACE

Deletes the character to the left of the cursor position if the cursor is in an unprotected field of a form. Characters to the right of the cursor and the cursor itself are shifted left. If the cursor is at the beginning of a field, BACKSPACE does nothing. If the cursor is not currently within a field, the message

`Cursor not in field`

is displayed and the workstation beeps.

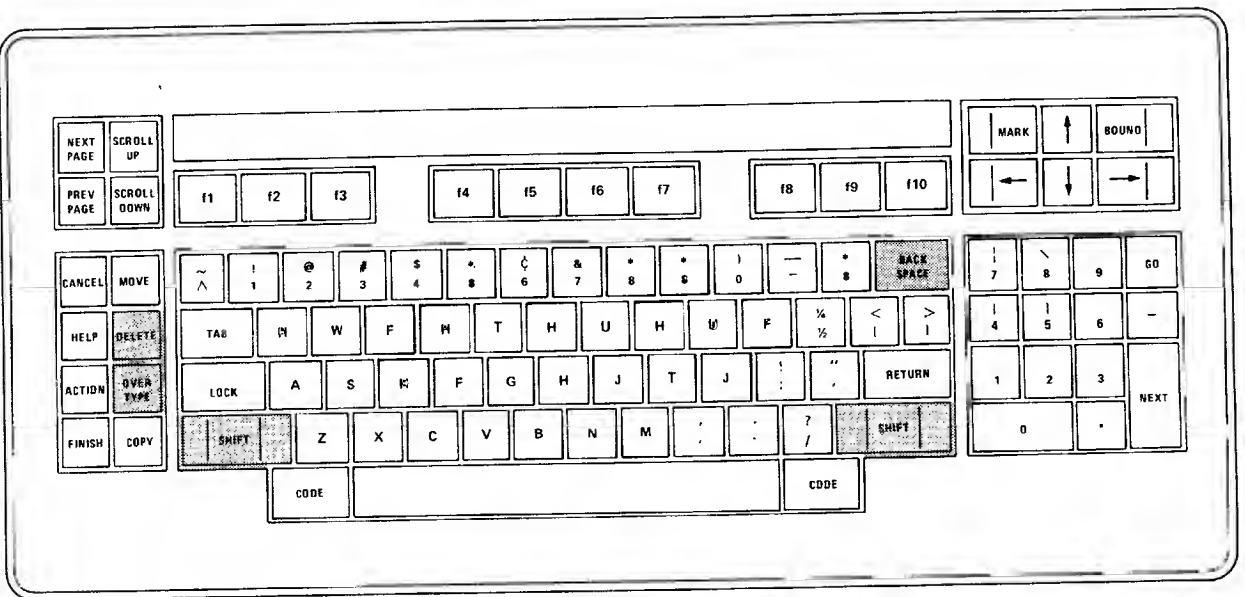
DELETE

Deletes the character at the cursor position if the cursor is currently in an unprotected field of a form. Characters to the right of the cursor are shifted left to replace the deleted character. If the cursor is not currently within a field, the message

`Cursor not in field`

is displayed and the workstation beeps.

Figure 8-2 Editing Keys in Format Display



SHIFT-DELETE

Deletes the content of the current field. If the cursor is not currently within a field, the message

`Cursor not in field`

is displayed and the workstation beeps.

OVERTYPE

Switches between insert and overtype modes when you are entering data. The OVERTYPE LED is off when insert mode is selected and on when overtype mode is selected.

Insert mode. In insert mode, the new data are inserted before the cursor position. Characters on the line at and to the right to make room for the new characters being entered. Except for being shifted, text is not affected by the insert mode. (The overtype mode is used to change existing text.) However, if the insertion causes characters to extend past the end of the field the message

`Field full`

is displayed and further data are rejected.

Overtyping Mode. In overtype mode, new data replace existing characters with new characters beginning at the cursor position. (The insert mode is used to enter new data without affecting existing text.)

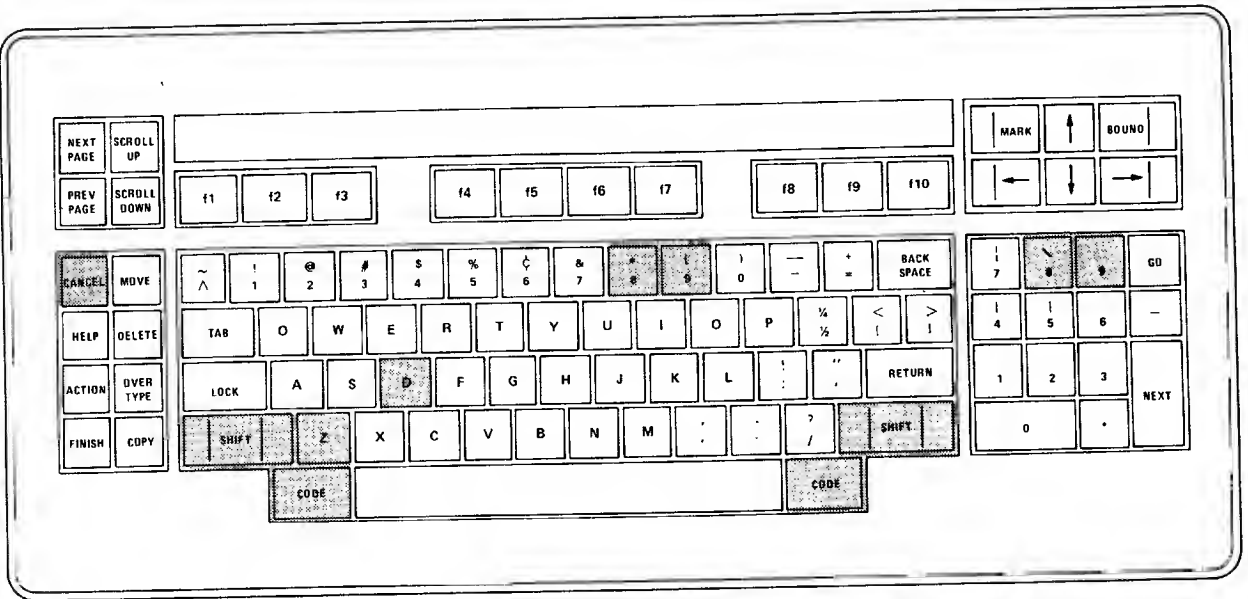
Management Operations

Management operations (See Table 8-3 and Figure 8-3) allow you to clear the keyboard locked condition.

Table 8-3 **Management Operations in Format Display**

Keys	Operations
CANCEL	Clears the keyboard lock condition and any messages displayed in the status frame
CODE-d	Deletes the content of all unprotected fields
CODE-8	Turns on printer logging
CODE-9	Turns off printer logging
SHIFT-CANCEL	Resets communications
CODE-CANCEL	Resets MTP

Figure 8-3 Management Keys in Format Display



The following is a description of each key or key combination and its function.

CANCEL

Clears the keyboard lock condition and any messages displayed in the status frame. If you press any other key when the keyboard is locked, the workstation beeps and ignores your action.

CODE-d

Deletes the content of all unprotected fields. The formatting of display memory is not affected.

CODE-8

Turns on the printer logging option. Printer logging directs data characters received from the host computer to the printer as well as to display memory.

CODE-9

Turns off printer logging.

SHIFT-CANCEL

Performs a communications reset. Printer logging, file recording, hexadecimal display, and monitoring are turned off. Text display is selected.

CODE-CANCEL

Resets MTP to its initial state. Display memory, format settings, and the programmable function keys (advanced operations) are cleared.

Press HELP to restart MTP.

Transmission Types

MTP supports two types of transmission to a host computer: block and conversational. When you use *block transmission*, each character of data is entered into display memory as you enter it and is sent to the host computer only when you instruct MTP to send it. When you use *conversational transmission*, each character of data is sent directly to the host computer as you enter it at the keyboard.

Both block and conversational transmission can be used with either text or format display. If format display is used with conversational transmission, every character that you enter in an unprotected field is sent to the host computer as you type it. Generally, when conversational transmission is used with format display, the host computer, rather than MTP, checks your data for validity. This is because your data are sent to the host computer before MTP can check their validity.

The transmission type that you use is independent of MTP's editing and format checking capabilities. You can use any MTP operation defined in the "Text Display Operations" and "Format Display Operations" sections with block or conversational transmission.

Block Transmission

Block transmission is for applications where you are using MTP to send large pieces of information to a host computer that only infrequently responds to you. An example of this type of application is document preparation.

With block transmission, you can place data into display memory and alter the data with MTP editing operations before sending the data to the host computer. For example, you can read a file of data into display memory and sort the data with MTP sort operations before sending the data to the host computer.

In block mode,

BLOCK

is displayed in line 1 of the status frame.

The two modes of block transmission available to you are line mode and edit mode.

Line Mode

When you use line mode, the line or unprotected field of data on which you are working is sent to the host computer when you enter a line terminator or exit the field. You can edit a line or field as you enter the data, but you send the data only when you terminate the line or exit the field. The only data sent to the host computer are the data in display memory after you have completed your editing.

Line mode operates on single fields and screen lines of data only. If you have a line of data that extends over two screen lines, only the data on the second screen line is sent when you press RETURN.

Edit Mode

When you use edit mode, the data you enter into display memory are not sent to the computer until you explicitly instruct MTP to do so. You can edit large areas of display memory without sending the data to the host computer.

When you command MTP to send data to the host computer, MTP sends only the data in display memory. (See Section 10, "Advanced Operations" for operations used to command MTP to send portions of display memory to the host computer.)

Conversational Transmission

Conversational transmission is for use in interactive applications requiring you to type commands to a host computer that is responding to you after you enter each command. Examples of this type of application are data base query and data processing.

When you enter data using conversational transmission, you need not use MTP's editing capabilities because the information in display memory has already been sent to, and processed by, the host computer. Therefore, changing display memory data will have little meaning to the host computer.

The two modes of conversational transmission available to you are half-duplex mode and full-duplex mode.

Half-Duplex Mode

When you use half-duplex mode, each character is entered into display memory and sent to the host computer as you enter it.

In half-duplex mode,

CONV/HALF

is displayed in line 1 of the status frame.

Full-Duplex Mode

When you use full-duplex mode, each character you enter is sent to the host computer as you enter it, but it is not entered into display memory. For the data that you type to appear on your screen, the host must *echo*, or return, the data to you.

Use full-duplex mode with host computers that echo your data in order to avoid entering each character into display memory twice—once when you enter it and once again when the host computer echoes it.

With full-duplex mode, some editing operations do not affect display memory but are sent to the host computer. As with characters that you enter, these operations must be echoed by the host computer to affect display memory. These operations are shown in Table 9-1.

In full-duplex mode,

CONV/FULL

is displayed in line 1 of the status frame.

Table 9-1 **Operations Sent to the Host Computer in Full-Duplex Transmission.**

Keys	Operations
↓	Moves the cursor down one line
RETURN	Text display: Inserts a line terminator in the current line and moves the cursor to the first character position of the next line Format display: Exits the current field and moves the cursor to the first character position of the next field
DELETE	Deletes the character at the current cursor position
SHIFT-DELETE	Text display: Deletes the line containing the current cursor position Format display: Deletes the content of the field containing the current cursor position

Advanced Operations

The three classes of advanced operations are available to you from the keyboard:

- Communications
- File
- Management

These operations can be used in text or format display. Some advanced operations display forms and thus clear the content of display memory. (See "Operational Procedures" in Section 3, for hints on how to avoid inadvertent loss of data when using these operations.)

For each class, a description of the operations is provided, followed by a table listing the keys used to perform these operations. Following this table is a more detailed description of each key and its associated operation. In some cases a key combination (several keys held down simultaneously) is needed. In this manual, key combinations are cited as the individual keys separated by a hyphen (for example, CODE-f1 indicates that CODE and f1 are to be held down at the same time).

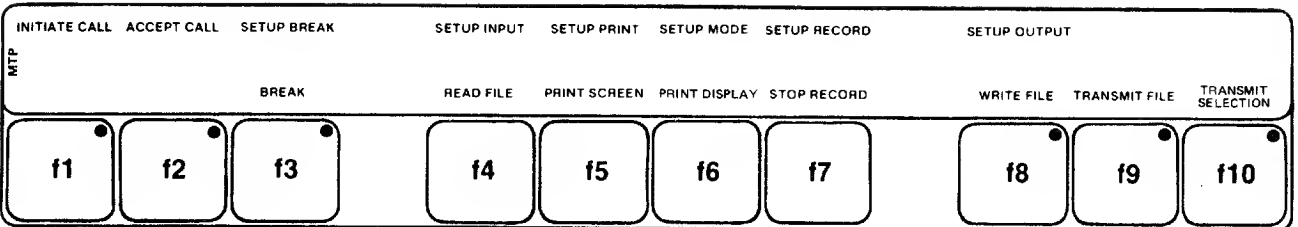
The advanced operation keys have an associated keyboard function control strip that defines each operation.

MTP Function Control Strip

The keyboard function control strip provided with MTP is designed to be inserted into the keyboard function control strip holder located directly above the function keys on the keyboard. (See Figure 4-1 in section 4.) This function control strip indicates the operations associated with each function key when you use MTP. The MTP function control strip and function keys are shown in Figure 10-1.

The MTP function control strip contains two rows of operation titles. The bottom row indicates the operations activated by the function keys when they are pressed. The top row indicates the operations activated by the function keys when they are held down simultaneously with the CODE key. Where an entry in a row on the function control strip is blank, there is no associated operation.

Figure 10-1 MTP Function Control Strip and Function Keys.



Communications Operations

Communications operations (See Table 10-1 and Figure 10-2) allow you to :

- ☐ Select the transmission type and the transmission type parameters you wish to use
- ☐ Initiate and accept calls over the communications line
- ☐ Select options for sending a break indication to the host computer
- ☐ Send a break indication

Table 10-1 **Communications Operations.**

Keys	Operations
CODE-f1	Initiates a call
CODE-f2	Accepts a call
CODE-f3	Sets up break indication options
f3	Sends break indication
CODE-f6	Sets up transmission type and transmission type parameters

The following is a description of each key or key combination and its function.

CODE-f1

Initiates a call to a host computer. A form is displayed when you press CODE-f1. The form asks you for information about the call you wish to initiate. When you have filled in the form, press GO. (See "Management Operations" in this section.)

The form for initiating a call is shown in figure 10-3. This form asks you for the network address of the host computer with which you wish to communicate and the packet data to be included in the request sent to the host computer to initiate the call.

The *network address* of a host computer is assigned by the public data network over which you are communicating. You must know the network address of a host computer in order to communicate with it.

Packet data are required by the host computer to establish a call between itself and MTP; this is typically a password.

Figure 10-2 Communications Operations Keys.

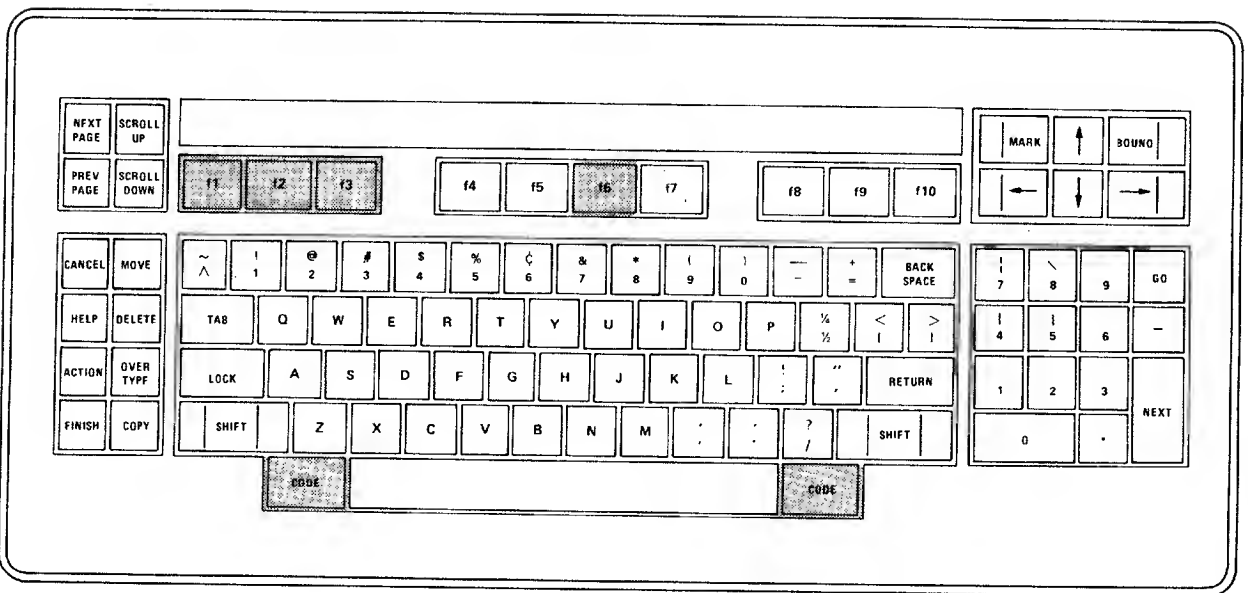


Figure 10-3 **CODE-f1 Form for Initiating a Call**

*** INITIATE A CALL ***

FILL IN THE FORM AND PRESS GO TO INITIATE THE CALL

NUMBER

PACKET DATA

Figure 10-4 **CODE-f2 Form for Accepting a Call**

*** ACCEPT A CALL ***

FILL IN THE FORM AND PRESS GO TO ACCEPT A CALL

LOW PORT HIGH PORT

Packet data are specific to each host computer. You must know the packet data required by a host computer to communicate with it.

NUMBER is the 14-digit network address to be called. MTP verifies that the number you enter is numeric.

PACKET DATA are 12 characters to be sent with the call. (See the operating procedures of your installation for further information.)

CODE-f2

Allows you to accept a call from a host computer.

A form is displayed when you press CODE-f2. The form asks you for information about the call you wish to accept. When you have filled in the form, press GO. (See "Management Operations" in this section.) MTP will accept the call.

The form for accepting a call is shown in Figure 10-4. This form asks you for the range of ports (low port and high port) within which you wish to accept calls. A *port* is the 1188141

last two digits for the 14-digit network address by which the host computer calls you.

LOW PORT is the 2-digit number of the lowest port number for which you wish to accept a call.

HIGH PORT is the 2-digit number of the highest port number for which you wish to accept a call. The range of ports within which you wish to accept calls is specific to your application. (See the documentation of your installation to determine the high and low ports to use.) MTP verifies that the numbers you enter are numeric.

CODE-f3

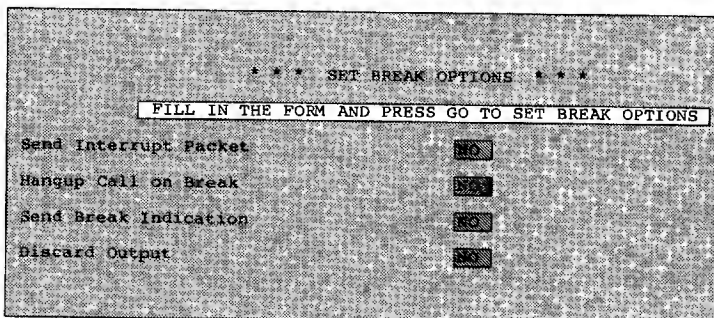
Sets up the actions MTP is to take when you press f3 (to send a break indication).

Pressing CODE-f3 displays the form shown in Figure 10-5. This form asks you to select from four break options to be initiated when you press f3 (to send a break indication).

When you have filled in the form, press GO (see "Management Operations" in this section). Once you press GO, the options you selected remain in effect until you or the host computer change them. (See the "See the MTP X.25 Communications Option" section of the *X.25 Gateway Operations and Programming Guide* for a description of how these options can be changed by the host computer.)

You can answer *Y* (yes) or *N* (no) to any or all of the four options. (NO is the default option that MTP automatically displays in the form.) MTP verifies your choice and will not accept any other entries. The options you choose are specific

Figure 10-5 **CODE-f3 Form for Setting Break Options**



```
*** SET BREAK OPTIONS ***

FILL IN THE FORM AND PRESS GO TO SET BREAK OPTIONS

Send Interrupt Packet      NO
Hangup Call on Break      YES
Send Break Indication     NO
Discard Output            NO
```

to your application. (See the documentation of your installation for further information.)

f3

f3 causes MTP to perform the break indication options you chose in the CODE-f3 from (or which the host computer selected). Pressing f3 does not display a form and does not affect the content of display memory.

CODE-f6

Allows you to select the transmission type and associated parameters to be used.

A form is displayed when you press CODE-f6. The form asks you for information about the transmission type you wish to use. When you have filled in the form, press GO (see Management Operations" in this section; MTP will then activate your choices.

The CODE-f6 form is shown in Figure 10-6. This form asks you to enter a single letter to choose the transmission mode you wish to use. Choosing the transmission mode automatically chooses the transmission type to be used (full-duplex mode and half-duplex mode are both conversational type; edit mode and line mode are both block type).

MODE (Full, Half, Edit, or Line) is the transmission mode and type and must be one of the following:

F indicates full-duplex mode, conversational type

H indicates half-duplex mode, conversational type

Figure 10-6 **CODE-f6 Form for Selecting Transmission Mode and Type.**

The screenshot shows a terminal window with a dark background. At the top, the text "*** SELECT MODE ***" is displayed. Below this, a rectangular box contains the instruction "FILL IN THE FORM AND PRESS GO". Underneath the box, the text "MODE (Full, Half, Edit, or Line)" is shown, followed by a small square cursor icon.

E indicates edit mode, block type

L indicates line mode, block type

File Operations

File Operations (see Table 10-2 and Figure 10-7) allow you to set the file specification for each of the workstation files MTP can access and transfer data between display memory, the communications channel and files. The file operations and forms are identical for all the communications options.

Table 10-2 **File Operations.**

Keys	Operations
CODE-f4	sets the input file specification
CODE-f5	sets the printer file specification
CODE-f7	sets the recording file specification and starts file recording
CODE-f8	sets the output file specification
f4	reads the input file into display memory
f5	Sends the content of the window to the printer file
f6	Sends the content of display memory to the printer file
f7	Stops file recording
f8	Sends the content of display memory to the output file
f9	Sends the input file to the host computer
f10	Sends the display memory selection to the host computer

The following is a description of each key or key combination and its function.

Code-f4

Allows you to set the file specification for the MTP input file. When you press CODE-f4, the form shown in Figure 10-8 is displayed. This form asks you to enter a *file specification*, which can be any valid file specification (see the *BTOS Reference Manual* for details).

FILE NAME is the unique file specification (up to 30 characters) of the file you wish to read or send. If you have already read or sent a file during an earlier session MTP displays that file specification in the unprotected field until you enter new information to override it.

Figure 10-7 File Operation Keys (BTOS K3 Keyboard)

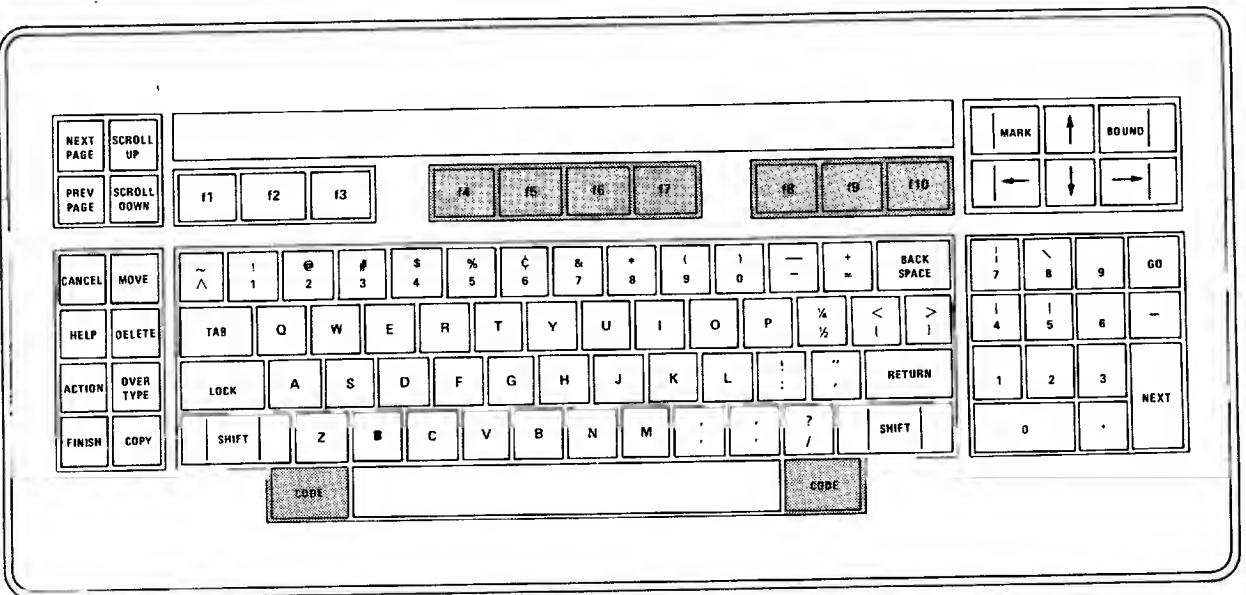


Figure 10-8 **CODE-f4 Form for Selecting an Input File Specification.**

The screenshot shows a terminal window with a dark background. At the top, the text "*** SETUP INPUT FILE ***" is displayed. Below this, a rectangular box contains the instruction "FILL IN THE FORM AND PRESS GO". To the left of the form, the label "FILE NAME" is visible. The form itself is a horizontal bar with a textured, shaded appearance, indicating it is a field for user input.

Figure 10-9 **CODE-f5 Form for Selecting a Printer File Specification.**

The screenshot shows a terminal window with a dark background. At the top, the text "*** SETUP PRINTER FILE SPEC ***" is displayed. Below this, a rectangular box contains the instruction "FILL IN THE FORM AND PRESS GO". To the left of the form, the label "PRINTER FILE SPEC" is visible. The form itself is a horizontal bar with a textured, shaded appearance, indicating it is a field for user input.

When you have filled in the form, press GO (see "Management Operations" in this section). The file specification you entered becomes the file specification of the input file and will remain, even in later sessions, until you press CODE-f4 again and enter a new file specification.

CODE-f5

Allows you to set the unique file specification for the MTP printer field. When you press CODE-f5, the form shown in Figure 10-9 is displayed. This form asks you to enter a file specification, which can be any valid file, spooler, or byte stream specification. (See the *BTOS Reference Manual* for details.)

When you have filled in the form, press GO (see "Management Operations" in this section). The file specification you entered becomes the file specification of the printer file and will remain, even in later sessions, until you press CODE-f5 again and enter a new file specification.

PRINTER FILE SPEC is the file specification (up to 30 characters) of the file or printer to which data are to be sent. This file specification can also be the printer queue name (for example, [SPL]) or the actual name of the device (for

example, [Lpt]). (See the *BTOS Reference Manual*.) If you have already selected a file during an earlier session, MTP displays that file specification in the unprotected field until you enter new information to override it.

CODE-f7

Allows you to set the file specification for the MTP recording file and start recording data from the host computer into this file. When you press CODE-f7, the form shown in Figure 10-10 is displayed. This form asks you to enter a file specification, which can be any valid file specification. (See the *BTOS Reference Manual* for details.) When you have filled in the form, press GO. (See "Management Operations" in this section.) The file specification you entered becomes the file specification of the recording file. File recording begins.

FILE NAME is the unique file specification (up to 30 characters) you want to give this session.

CODE-f8

Allows you to set the file specification for the MTP output file. When you press CODE-f8, the form shown in Figure 10-11 is displayed. This form asks you to enter a file specification, which can be any valid file specification. (See the *BTOS Reference Manual* for details.)

When you have filled in the form, press GO. (See the "Management Operations" subsection.) The file specification you entered becomes the file specification of the output file.

FILE NAME is the unique file specification (up to 30 characters) of the file to which you want display memory written.

Figure 10-10 **CODE-f7 Form for Selecting a Recording File Specification.**

The screenshot shows a terminal window with a dark background and light-colored text. At the top, it says "*** RECORD SESSION ***". Below that, a rectangular box contains the text "FILL IN THE FORM AND PRESS GO TO START RECORDING". Underneath this box, the label "FILE NAME" is followed by a long, empty rectangular input field.

Figure 10-11 **CODE-f8 Form for Selecting an Output File Specification.**

The screenshot shows a terminal window with a dark background and light-colored text. At the top, the text reads "*** SETUP OUTPUT FILE ***". Below this, there is a rectangular box containing the instruction "FILL IN THE FORM AND PRESS GO". To the left of this box, the text "FILE NAME" is displayed. Below the instruction box, there is a horizontal bar with a hatched pattern, representing a text input field.

f4

Places the content of the input file into display memory at the cursor position.

Pressing f4 does not display a form. If MTP is in text display, pressing f4 clears display memory and reads the input file into display memory starting at the first character position. If MTP is in format display, pressing f4 clears the unprotected fields.

f5

Sends the data displayed in the window to the printer file. Only nonblank portions of the window are sent.

Pressing f5 does not display a form and does not affect the content of display memory.

f6

Sends the nonblank portions of display memory to the printer file.

Pressing f6 does not display a form and does not affect the content of display memory.

f7

Stops file recording on the recording file.

Pressing f7 does not display a form and does not affect the content of display memory.

f8

Sends the nonblank portions of display memory to the output file.

Pressing f8 does not display a form and does not affect the content of display memory.

f9

Sends the content of the input file to the host computer over the communications line.

Pressing f9 does not display a form and does not affect the content of display memory.

f10

Sends the content of the current selection to the host computer over the communications line.

Pressing f10 does not display a form and does not affect the content of display memory.

Management Operations

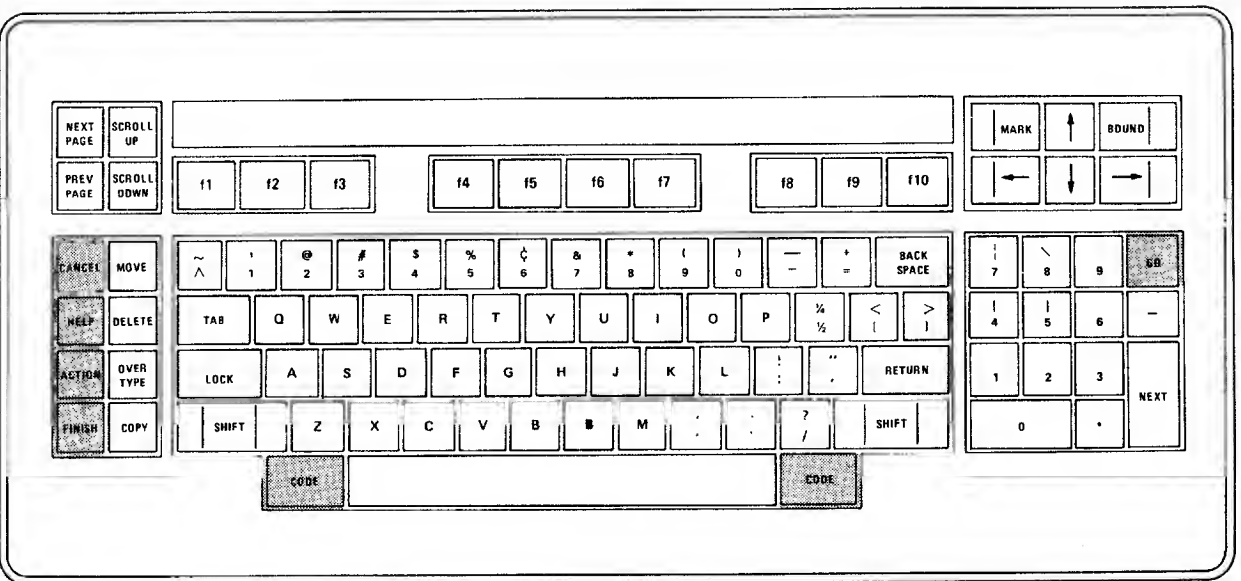
Management operations (see Table 10-3 and Figure 10-12) allow you to:

- ☐ Cancel and execute forms displayed by advanced operations
- ☐ Cancel advanced operations in progress
- ☐ Hang up a current call
- ☐ Display information describing the advanced operations
- ☐ Terminate MTP.

Table 10-3 **Management Operations.**

Keys	Operations
ACTION-CANCEL	Cancels the operation in progress
FINISH	Hangs up the current call
CODE-FINISH	Terminates MTP
GO	Executes a form
CODE-GO	Cancels a form and clears display memory
HELP	Displays information about advanced operations

Figure 10-12 Management Operation Keys. (BTOS K3 Keyboard)



The following is a description of each key or key combination and its function.

ACTION-CANCEL

Cancels an advanced operation once you have started the operation.

FINISH

Hangs up the current call.

When you are using X.25, MTP ends the current call to the host computer.

When you are using the local serial channel communications option, MTP ignores any data waiting to be sent to the host computer in a buffer. Any data that are still in the window are not lost, but remain in display memory.

CODE-FINISH

Terminates MTP and returns you to the workstation software from which MTP was activated (normally the Executive).

GO

Executes an advanced operation form once you have completed it.

CODE-GO

If you are using format display, CODE-GO cancels an advanced operation, clears display memory, and selects text display. If you are already using text display, CODE-GO only clears display memory.

HELP

Displays information describing the advanced operations as depicted in Figure 10-13.

Note: Pressing *HELP* clears display memory.

If MTP is in conversational transmission, pressing *HELP* automatically switches MTP to block transmission (thus, the action of pressing *HELP* is not sent to the host computer).

Figure 10-13 HELP Display.

```
MULTIMODE TERMINAL PROGRAM

CODE-F1 - INITIATE A CALL
CODE-F2 - ACCEPT A CALL
CODE-F3 - SELECT BREAK OPTIONS
CODE-F4 - SELECT READ FILE
CODE-F5 - SELECT PRINT FILE
CODE-F6 - SELECT MODE
CODE-F7 - SELECT RECORD FILE
CODE-F8 - SELECT OUTPUT FILE

F3 - SEND BREAK
F4 - READ FILE INTO DISPLAY
F5 - PRINT SCREEN
F6 - PRINT DISPLAY
F7 - STOP SESSION RECORDING
F8 - WRITE DISPLAY TO FILE
F9 - TRANSMIT FILE TO HOST
F10 - TRANSMIT SELECTION TO HOST

ACTION-CANCEL - CANCEL OPERATION IN PROGRESS
FINISH        - HANGUP CURRENT CALL
CODE-FINISH   - RETURN TO EXECUTIVE
GO            - EXECUTE FORM
CODE-GO       - CLEAR SCREEN/CANCEL FORM
```


Status Display

The status frame (see Figure 11-1) contains four lines of information that are continuously updated by MTP:

- Line 1 displays the MTP title, the transmission type that is in use, and the date and time.
- Line 2 displays file and monitoring options and the operator messages in use.
- Line 3 displays the current MTP status and the display type.
- Line 4 is a highlighted message line used to display status messages.

In the following subsections, the circled numbers in the figures correspond to the numbered explanations in the text that follows.

Table 11-1 lists all the messages displayed in the status frame by status line. For further information, see the appropriate message in Appendix A.

Figure 11-1 **Status Frame.**

MULTIMODE TERMINAL PROGRAM		BLOCK	Feb. 13, 1982 10:25 a.m.	
IN:mtp-inputfile	OUT:mtp-outputfile	PRT:mtp-printfile	REC:mtp-recordfile	
Ready 10/809 XMT	Text Insert	Recording-ON	Print-ON	X25

Table 11-1 **Status Frame Messages.**

Status Line 1	Status Line 3
title	Ready nnnn/mmmm
BLOCK	BUSY
CONV/FULL	CALLING
CONV/HALF	KEYBOARD-LOCKED
date time	PAUSING
Master-Station-Not-Running	READ-FROM-DISK
Status Line 2	TRANSMITTING
<i>File Options</i>	WAIT-FOR-CALL
IN:filename	WAIT-FOR-HOST
OUT:filename	WAIT-FOR-LINE
PRT:filename	WAIT-FOR-PRINT
REC:filename	WRITE-TO-DISK
<i>Monitoring Options</i>	XMT
HEX-DISPLAY	Format
MONITOR	Text
VIDEO-OFF	Insert
<i>Operator Messages</i>	Overtime
see the documentation	Recording-ON
of your installation	Print-ON
	X25
	Status Line 4
	status messages
	(see Appendix A)

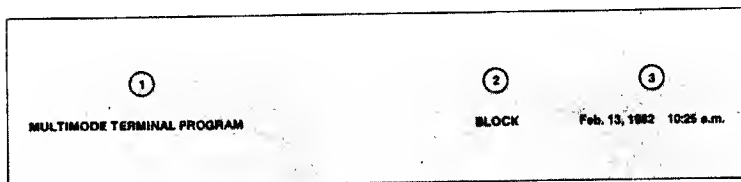
Status Line 1

Status line 1 (Figure 11-2) displays the following information:

- 1 Title.** Identifies MTP. This title can be customized for individual applications.
- 2 Transmission Type.** Indicates the current transmission type: BLOCK, CON/FULL (conversational full-duplex), or CONV/HALF (conversational half-duplex).
- 3 Date and Time.** Displays the current date and time. On a cluster workstation, the message

Master-Station-Not-Running

is displayed if the master workstation is not communicating with the cluster workstation.

Figure 11-2 **Status Line 1.**

Status Line 2

Status line 2 displays

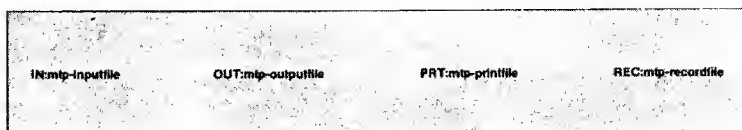
- ☐ File options
- ☐ Monitoring options
- ☐ Operator messages.

Initially, status line 2 is blank. You can select what information is displayed by pressing ACTION-NEXT. Each time you press ACTION NEXT, MTP selects the next display in the sequence described above.

That is, the first time you press ACTION-NEXT, MTP displays the file options; the second press displays the monitoring options; and the third press displays operator messages (if any exist; if not, Status Line 2 is blank).

File Options

Status Line 2 (Figure 11-3) also displays the current file specifications for the input (IN:), output (OUT:), printer (PRT:), and recording (REC:) files. If a particular message is not displayed, you did not set that particular file specification.

Figure 11-3 **Status Line 2 Displaying File Options.**

Monitoring Options

If you selected one of the three monitoring options, status line 2 displays one of the following: MONITOR, HEX-DISPLAY or VIDEO-OFF. (See Figure 11-4, and for further information see the appropriate message in Appendix A.) If none of these messages are displayed, you did not select any of the three options.

Figure 11-4 **Status Line 2 Displaying Monitoring Options.**



Operator Messages

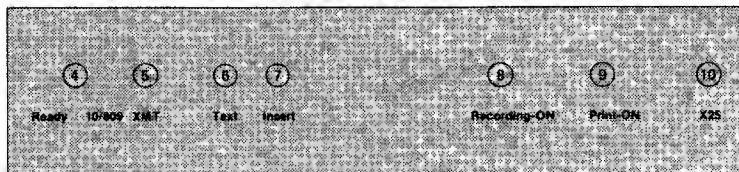
The host computer may send messages to your workstation to notify you of host computer status conditions. MTP displays these messages in status line 2. For further information on these messages, see the documentation for the host computer.

Status Line 3

Status line 3 (Figure 11-5) displays the following information:

- 4 Current MTP Status. Indicates MTP's current operating status. This status is updated whenever a change occurs. The possible messages are shown in Table 11-2; see Appendix A further information.
- 5 XMT. Indicates characters are currently waiting to be sent on the communications line.

Figure 11-5 **Status Line 3.**



- 6 Display Type. Indicates which display type you are using: Text or Format.
- 7 Type-In Mode. Indicates which type-in mode you are using: Insert or Overtyping.
- 8 Recording-On. Indicates you selected the file recording option.
- 9 Print-On. Indicates you selected the printer logging option.
- 10 X25. Indicates that MTP is using X.25 Network Gateway.

Table 11-2 **Current MTP Status Messages Displayed in Status Line 3.**

BUSY	TRANSMITTING
CALLING	WAIT-FOR-CALL
KEYBOARD-LOCKED	WAIT-FOR-HOST
PAUSING	WAIT-FOR-LINE
READ-FROM-DISK	WAIT-FOR-PRINT
Ready <i>nnnn</i> / <i>mmmm</i> *	WRITE-TO-DISK

**nnnn* starts from zero; *mmmm* starts from 1.

Status Line 4

Status line 4 (see Figure 11-1) is a highlighted line that displays status and error messages generated by MTP. Under normal operating conditions, this line is blank. In Figure 11-1, the blank status line 4 is represented by a white bar across the status frame. On the display screen it will appear as a highlighted line.

The messages that can be displayed in status line 4 are listed in Appendix A:

Status and Error Messages

The following communications, keyboard, and field verification program status and error messages are displayed in the status frame. The messages are listed alphabetically by status frame line. For status codes, see the *BTOS X.25 Gateway Operations and Programming Guide*

Status Line 1

BLOCK

Your program is operating in block transmission type.

CONV/FULL

Your program is operating in conversational transmission type, full-duplex mode.

CONV/HALF

Your program is operating in conversational transmission type, half-duplex mode.

Master-Station-Not-Running

The master workstation is not communicating with the cluster workstation.

Status Line 2

HEX-DISPLAY

All data entered into display memory are displayed as two hexadecimal digits.

IN:filename

This indicates the current input file specification.

MONITOR

Monitor mode is enabled.

OUT:filename

This indicates the current output file specification.

PRT:filename

This indicates the current printer file specification.

REC:filename

This indicates the current recording file specification.

VIDEO-OFF

Data are not displayed on the screen.

Status Line 3

BUSY

MTP is busy.

CALLING

MTP is establishing a call.

Format

MTP is in format display.

Insert

MTP is in insert mode.

KEYBOARD-LOCKED

The keyboard is locked. Status Line 4 displays a status message indicating the reason for the keyboard lock condition.

Overtime

MTP is in overtime mode.

PAUSING

Sending data to the host computer has been delayed.

Print-ON

Data from the host computer are being printed.

READ-FROM-DISK

MTP is reading an input file from a disk into display memory.

Ready *nnnn*/*mmmm*

MTP is ready to accept your input. The line number in display memory that contains the cursor is *nnnn*; the first line of display memory is line *QQQQ*. The total number of lines in display memory is *mmmm*.

Because *nnnn* begins with zero, its value is one less than the actual line count; for example, if *nnnn* is 17, the cursor is on the 18th line.

Recording-ON

All commands from the host computer are being recorded.

Text

MTP is in text display.

TRANSMITTING MTP

is sending input to the host computer.

WAIT-FOR-CALL

MTP is waiting for a call from the host .computer.

WAIT-FOR-HOST

MTP is waiting on the host computer.

WAIT-FOR-LINE

MTP is waiting for a communications line.

WAIT-FOR-PRINT

MTP is waiting to print.

WRITE-TO-DISK

MTP is writing a file on a disk X25 MTP is using the X.25 Network Gateway. XMT MTP is sending data to the host computer.

Status Line 4

Alphabetic field

You entered a non-alphabetic character in a field formatted to accept only alphabetic characters. Data must consists of A through Z, a through z, space, hyphen, or period. Correct your entry and continue.

An invalid choice has been entered

Data in this field are verified against entries in a look-up table. The data you entered into the field do not match any entry in the look-up table. Correct your entry and continue.

Cannot copy up

You tried to copy a selection to a point in display memory that is above where you started the selection. Selections can be copied only to a point farther down in display memory. Correct your entry and continue.

Capacity control

field You attempted to exit a field before completely filling it in. The current field must be completely filled in and must not contain any spaces. Correct your entry and continue.

Connection dropped by host

This message indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

X.25 Communications Option

An invitation-to-clear packet was received. The call was cleared. Either your connection to the host computer was not completed or data you were sending or receiving has not been lost. For further information, see the *Multimode Terminal Program Reference Manual*.

BTOS error code *nnnn* Communications channel not available

A BTOS error was encountered because the local channel you specified is already in use by other communications software. See the *BTOS Status Codes Reference Manual* for a definition of the status code. This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

BTOS error code *nnnn* Communications error

A BTOS error was encountered during an extended communications option operation. Either your connection to the host computer was not completed or data you were sending or receiving have been lost. See the *BTOS Status Codes Reference Manual* for a definition of the status code. This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

BTOS error code *nnnn* Communications server is not installed

BTOS error was encountered because the Multiline Communications Server software required for the extended communications option is not installed. See the *BTOS Status Codes Reference Manual* for a definition of the status code. This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

BTOS error code *nnnn* Delete output file

A BTOS error was encountered while you were attempting to delete the output file. The file was not deleted. See the *BTOS Status Codes Reference Manual* for a definition of the status code. This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

BTOS error code *nnnn* Input file

A BTOS error was encountered while you were accessing the input file. See the *BTOS Status Codes Reference Manual* for a definition of the status code.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

BTOS error code *nnnn* Output file

A BTOS error was encountered while you were accessing the output file. See the *BTOS Status Codes Reference Manual* for a definition of the status code.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

BTOS error code nnnn Printer file

A BTOS error was encountered while you were accessing the printer file. See the *BTOS Status Codes Reference Manual* for a definition of the status code.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

BTOS error code nnnn Recording file

A BTOS error was encountered while you were accessing the recording file. See the *BTOS Status Codes Reference Manual* for a definition of the status code.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

BTOS error code nnnn Rename output file

A BTOS error was encountered while you were attempting to rename the output file to *filename-OLD*. See the *BTOS Status Code Reference Manual* for definition of the status code.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

BTOS error code nnnn Termination error

The subsystem that activated MTP terminated abnormally. See the *BTOS Status Codes Reference Manual* for a definition of the status code.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

BTOS error code nnnn X.25 communication error

Either your connection to the host computer was not completed or data you were sending or receiving have been lost. See the *BTOS Status Codes Reference Manual* for further information. Check the communications line and/or the host computer.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Cursor beyond right margin

You attempted to enter data when the cursor was beyond the right margin. Use the cursor keys to move the cursor within the margin to enter data, or reset the right margin (press CODE-i). Correct your entry and continue.

Cursor not in field

You attempted to enter text when the cursor was beyond the field. Use the cursor keys to move the cursor within the field. Correct your entry and continue.

Display memory full

You reached the capacity of display memory. You can either save the content of display memory or delete some of the data.

Divide by zero

A field verification program division operation attempted to divide by zero. Contact the systems analyst who wrote the field verification program.

Divisor too large

A divisor in a field verification program division exceeded the size of an accumulator. Contact the systems analyst who wrote the field verification program.

Edit prog - invalid accumulator

The specified accumulator is invalid. The valid range for accumulators is A0 through A31. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit prog - invalid comparison

An invalid comparison was made in the field verification program. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit prog - invalid field

A command in the field verification program referenced a field number greater than 100. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit prog - invalid numeric operator

An invalid numeric operator was encountered in the field verification program. Valid operators in arithmetic statements in the field verification program are:

+ - * / ! !!

Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit prog - invalid relational op

An invalid relational operator was encountered in the field verification program. Valid relational operators in conditional transfer statements are:

= <> < <= > >=

Contact the systems analyst who wrote the field verification program. This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit prog - invalid statement

A field verification program was not recognized because the syntax of the statement is invalid. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit prog - missing "-"

An assignment statement in the field verification program was incorrectly specified. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit prog - no nnnn for IF

An IF statement in the field verification program was incorrectly specified. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit prog - no such label/no end

A reference was made to an undefined field verification program. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit prog - numeric literal expected

During field verification program processing, a command was encountered in which a numeric literal was expected but not received. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit prog - numeric value expected

During field verification program processing, a command was encountered in which a number was expected but not received. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit prog - quoted string too long

A string within the field verification program exceeded the maximum string length of 136 bytes. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit prog - syntax undefined

The syntax of the field verification program is in error. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Edit program too large

The field verification program is too large to fit in the buffer allocated for it. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Excessive recursion in function keys

The constructed control sequence exceeds the maximum nesting limit of eight. Simplify the control sequence to reduce the level of nesting.

For example, the control sequence

ESC:1

'ESC:1?'

would cause this message to be displayed when f1 is pressed because the sequence would loop forever. Contact the systems analyst who wrote the field verification program. For further information, see the *Multimode Terminal Program (MTP) Programming Reference Manual*.

Excessive recursion in strings

More than eight nested active calls to strings have occurred within the field verification program. Contact the systems analyst who wrote the field verification program. This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Field Full

You attempted to insert characters into a field that is already full. Either select OVERTYPE mode to replace characters within the field, or press SHIFT-DELETE to clear the field.

Field overflows line

The form you are working on contains a field with a defined length greater than the width of the display line. The form must be redefined. Contact the systems analyst who wrote the form.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Field overlaps with other field

The form you are working on contains fields that overlap. The form must be redefined. Contact the systems analyst who wrote the form. This message also indicates the keyboard is locked. You must press CANCEL to unlock the keyboard.

File Name already in use

The file name you input already exists. The file name must be unique. You must press CANCEL to clear the error message.

Host Does Not Recognize X29 Packet

An X.29 error packet was received in response to an X.29 packet sent by MTP. Either your connection to the host computer was not completed or data you were sending or receiving have been lost. For further information, see the *Multimode Terminal Program (MTP) Programming Reference Manual*.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Input file in use.

You attempted to load a background job when the input file was already opened. Correct your entry and continue. This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Invalid column specification

Either the character position you indicated with MARK is to the right of the character position you indicated with CODE-BOUND or the column you selected will not fit on the screen after the move or copy. Correct your entry and continue.

Invalid selection

Your text or column selection is invalid. Invalid selections include using the MARK and BOUND (or CODE-BOUND) keys when display memory is in format display. Correct your entry and continue.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Invalid sort specification

Either you invoked the sort operation without having a column selection on the screen or the character position you indicated with MARK is to the right of the character position you indicated with CODE-BOUND. Use the MARK and CODE-BOUND keys to correctly select the sort area.

Invalid syntax

You entered incorrect information after entering CODE-^ in status line 4. Refer to "Text Display Operations," Section 7 for further information. Correct your entry and continue.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Invalid table entry

Your entry in the field is not one of the allowable entries for that field. Correct your entry and continue.

Left justify field

The field was specified as left justified; therefore, the first character you enter in the field must be a nonblank character. Correct your entry and continue.

No buffer for verification program

Space was not reserved for the field verification program. Contact the systems analyst who wrote the field verification program.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

No character under cursor

You attempted to delete a character within a field on the form, but the cursor was not positioned on a character. Correct your entry and continue.

No connection to host

Data were sent on the communications channel, but a host computer was not connected to it. The data were lost. Re-establish the connection with the host computer before sending any more data.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Non-numeric character in field

You attempted to enter an alphabetic character into a field defined as numeric only. The allowable characters are:

0 1 2 3 4 5 6 7 8 9 . -

Correct your entry and continue.

No space for range table

Display memory is not large enough to hold the range tables defined for the field verification program. Contact the systems analyst who wrote the field verification program. More system memory must be made available to run MTP.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

No such format

An invalid escape sequence was received from the host computer. Contact the systems analyst.

Nothing to confirm

You pressed GO to confirm a replacement, but you were not doing a search and replace operation. Correct your entry and continue.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Numeric field

You attempted to enter non-numeric data into a field that is defined as numeric data only. Numeric data consist of:

0 1 2 3 4 5 6 7 8 9 . -

Correct your entry and continue.

Output file in use You attempted to delete or rename the output file while the output file was open. Correct your entry and continue. This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Overflow in multiplication

A field verification program multiplication exceeded the size of an accumulator. Contact the systems analyst who wrote the field verification program.

**Press GO to replace, CANCEL to skip item,
ACTION-CANCEL to finish operation**

MTP has found an occurrence of the source text you wish to replace. To make the replacement, press GO. To prevent replacement of this occurrence but to continue the search, press CANCEL. To prevent the occurrence and end the search, press ACTION-CANCEL.

Program error; invalid PUT statement

The Put statement was invalid. Put statements have the format:

P "text"

P 'text'

P <fieldName>

P <accumName>

Contact the systems analyst who wrote the field verification program.

Protected field

You attempted to enter data into a protected field in the form. You can enter data only in unprotected fields. Correct your entry and continue.

Quoted string too long

The "text string" parameter in your search operation or the "source" and/or "replacement" parameter in your search and replace operation is too long; it exceeds the length of the line. You must shorten the parameter. Correct your entry and continue.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Replacement text missing

You did not include a "replacement" parameter in your search and replaced operation. You must include this parameter in the operation. If you want a null replacement, just enter two quotation marks (""). Correct your entry and continue.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Required field

The form you are working on contains a field in which you must enter data. However, the field does not contain any data. Correct your entry and continue.

Right justify field

The field is defined as right justified; therefore, any data you enter into it must end at the last character position of the field. Correct your entry and continue.

Source text missing

You did not include a "source" parameter in your search and replace operation. You must include this parameter in the operation. Correct your entry and continue.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Source text not found

The text string you were searching for in display memory either does not exist in display memory or the last occurrence has been passed. Correct your entry and continue.

Substitution complete

All occurrences of the text you specified in the "source" parameter of the search and replace operation have been replaced in display memory.

Text string missing

You did not include a "text string" parameter in your search operation. You must include this parameter in the operation. Correct your entry and continue.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Text string not found

The text string you were searching for either does not exist in display memory or the last occurrence has been passed.

The call has been cleared

The call was cleared by the X.25 Network Gateway, by the other party, or by the PDN. Any data being sent or received were lost. The call must be re-established for further communications. Contact the systems analyst.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

The network gateway is busy

The X.25 Network Gateway does not have enough virtual circuits to initiate a call at this time. Any data being sent or received were lost. Try the call later, or reinstall the X.25 Network Gateway with more virtual circuits. Contact the systems analyst.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

The network gateway is not installed

The X.25 Network Gateway has not been installed. Install it with the Install X.25 command described in the *BTOS X.25 Gateway Operations and Programming Guide*. Any data being sent or received were lost. Contact the systems analyst.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

The network has gone down

The X.25 Network Gateway is not communicating with the Public Data Network (PDN). All calls were cleared. Calls cannot be re-established until the PDN resumes operation. Any data being sent or received were lost. Contact the systems analyst.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

The value is not within the allowed range

Entries in this field are verified against a range in a look-up table. The data you entered do not match the range. Correct your entry and continued.

Timed out waiting for host

The 30-second timeout on the wait for a host computer message command has expired without a message being received from the host computer. Refer to the documentation of your installation for further information.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Undefined function for local channels

You requested an advanced function that is not available for local serial channels. This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard. Correct your entry and continue.

Unknown command

You entered a character other than F, S, or P after you entered CODE-^ in status line 4. For further information, see "Text Display Operations," Section 7. This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard. Correct your entry and continue.

X25 Communications error *nnnn*

An error not covered by any of the specified X.25 communications option error messages has been received from an X.25 packet level operation. The code *nnnn* is the error code returned by the operation. See the *BTOS X.25 Gateway Operations and Programming Guide*. Contact the systems analyst.

X29 Protocol violation

An X.29 packet containing invalid X.29 information was received. An X.29 error packet is sent. Any data being sent or received were lost. Contact the systems analyst.

This message also indicates the keyboard is locked. Press CANCEL to unlock the keyboard.

Communications Software Considerations

X.25 Communications

When you use X.25 communications, MTP uses special communications software for communicating with the host computer. The software used by MTP must be separately installed at the master workstation for cluster environments, or at your workstation for standalone systems, before MTP can communicate using X.25.

MTP uses the X.25 Network Gateway for host computer communications. The X.25 Network Gateway installation procedures are documented in the *X.25 Gateway Operations and Programming Guide*.

If the X.25 Network Gateway is not installed, when you attempt to establish a connection to the host computer by initiating or accepting a call, the message

The network gateway is not installed

is displayed in Status Line 4 and the keyboard is locked. Press CANCEL to remove the message and unlock the keyboard. Install the X.25 Network Gateway. You will then be able to communicate with the host computer using X.25 communications.

Cluster Workstations

When you use MTP from a cluster workstation, MTP uses the cluster to access the X.25 Network Gateway installed at the master workstation.

If communications with the master workstation is not operational when MTP attempts to access the X.25 Network Gateway to establish a connection to a host computer or to communicate data, the message

BTOS error code 6 X25 communications error

is displayed in Status Line 4 and the keyboard is locked. Correct the problem with the communications to the master. Press CANCEL to remove the message and unlock the keyboard. You can continue MTP operations.

Glossary

Auto-Exit. A field input characteristic that moves the cursor automatically to the next field when the end of the current field is reached.

Block Transmission. A transmission type in which data are entered into display memory as you enter them and are sent to a host computer only when you instruct MTP to do so. Also see Conversational Transmission, Edit Mode, and Line Mode.

Break Indication. A transmission sent when communicating using X.25 to inform a host computer that the terminal wishes to stop receiving information from it.

BTOS. B 20 Operating System.

Column Selection. A special type of selection that contains data within a rectangular area of display memory defined by the start and end of the selection. You can delete, move, copy, or sort a column selection. Also, see Selection and Text Selection.

Command. See Escape Sequence.

Command File. Contains MTP commands that can define the functions of programmable keyboard keys, select operational modes, or define application-specific forms. Also see Escape Sequence.

Conversational Full-Duplex Mode. See Full-Duplex Mode or Conversational Transmission.

Conversational Half-Duplex Mode. See Half-Duplex Mode or Conversational Transmission.

Conversational Transmission. A transmission type in which data are sent to a host computer as they are entered at the keyboard. Also, see Full-Duplex Mode, Half-Duplex Mode, and Block Transmission.

Cursor. The blinking underline on the screen that indicates where the next character can be entered.

Default Value. The value assumed by MTP for a field when you have not specified a particular value for that field.

Display Characteristic. Specifies how a field is to be displayed on the screen. Also, See Input Characteristics.

Display Memory. The part of the workstation's memory that

is used for storage of data and that can be displayed in the window of the screen. Also, see Window.

Echo. The return of data from the host computer back to the workstation. The host computer can echo data to the workstation when the workstation is operating in conversational transmission, full-duplex mode.

Edit Mode. One of two modes of block transmission. In edit mode, display memory is sent to the host computer only when MTP is explicitly commanded to do so. All or part of display memory can be selected for transmission. Edit mode is intended for applications requiring that data be extensively edited before being sent to the host computer. Also, see Block Transmission and Line Mode.

Edit Program. See Field Verification Program.

Escape Character. Indicates to the host computer that the succeeding character or group of characters are to be interpreted as a command instead of data. (The escape character is 1Bh.) Also, see Escape Sequence.

Escape Sequence. A group of characters interpreted by MTP as a command. The first character is an escape character; the second character is a command character that determines the number of subsequent characters. Once the entire escape sequence is processed as a command, the succeeding characters are interpreted as data until another escape sequence is encountered. Also, see Escape Character.

Field. An area of display memory defined as part of a form and used to display or receive data in format display. Also, see Format Display, Protected Field, and Unprotected Field.

Field Verification Program. A series of escape sequences unique to an application and written by a systems analyst. It is primarily used for input verification, but can also be used for complex functions such as arithmetic calculations and interpretation of host computer messages.

Form. A fixed-format, application-specific arrangement of display memory into areas called fields. The fields or the entire form can be sent to the host computer. The particular format of a form is specified by a systems analyst. Also, see Field and Format Display.

Format Display. One of two display types that presents display memory in a fixed-format manner with restrictions on how and where you can enter data. The exact presentation of display memory is organized according to an application-specific form. Also, see Form and Text Display.

Full-Duplex Mode. One of two modes of conversational transmission. In full-duplex mode, data are sent to the host computer as you enter them at the keyboard but are not simultaneously entered into the workstation's display memory. The host computer usually, but not necessarily, echoes (returns) the data to display memory. Also, see Conversational Transmission and Half-Duplex Mode.

Function Key. One of the ten keys, labeled f1 to f10, in the top row of the typewriter pad of the keyboard.

Half-Duplex Mode. One of two modes of conversational transmission. In half-duplex mode, data are simultaneously entered into the workstation's display memory and sent to the host computer as you enter them at the keyboard. Also, see Conversational Transmission and Full-Duplex Mode.

Host Computer. The primary or controlling computer in a communications system.

Input Characteristic. Specifies a characteristic about the type of, or the manner in which you enter, data in a field. Also see Display Characteristic.

Insert Mode. The mode in which characters typed from the keyboard are inserted into display memory just before the cursor. The cursor, and any characters on the line at and to the right of it, move to the right of the insertion to accommodate the new material. When MTP is in insert mode, the light on the OVERTYPE key is off. Also see Overtyping Mode.

Line Mode. One of two modes of block transmission. In line mode, MTP sends a line of display memory to the host computer when you enter a line terminator or exit a field, allowing you to edit each line of your data. Line mode is intended for line-by-line interactions with the host computer. Also see Block Transmission and Edit Mode.

Look-Up Table. A list of entries that are designated to be valid entries for a field. When you are using look-up tables, MTP compares your entry against the entries in a look-up table to verify that it is valid.

Overtyping Mode. The mode in which characters typed from the keyboard replace characters in display memory at the cursor position. MTP is in overtype mode when the light on the OVERTYPE key is on. Also see Insert Mode.

PDN. See Public Data Network.

Protected Field. Used to display preentered, constant infor-

mation and cannot be used to enter data in a form. Also see Field, Form, and Unprotected Field.

Public Data Network. A regulated provider of communications services.

Screen. The video display of the workstation (34 lines by 80 or 132 columns on the B 22, 28 lines by 80 columns on the B 21, and 29 lines by 80 columns on the B 25 and B 30 systems). The screen is divided into a status frame and a window. Also see Status Frame and Window.

Selection. An area of display memory that you identify for use in editing, deleting, moving, copying, or sorting operations. The selected area is highlighted in reverse video. Also see Column Selection and Text Selection.

Status Frame. The top four lines of the screen that contains status information. Also see Window and Screen.

Systems Analyst. A programmer who designs forms and field verification programs for MTP.

Text Display. One of two display types that presents display memory in a free-form manner with no restrictions on how and where you can enter data. In text display, data are organized into lines, much like type on a typed page. Also see Format Display.

Text Selection. A type of selection that contains a continuous block of data. You can edit, delete, move, or copy text selections. Also see Column Selection and Selection.

Type-Ahead Buffer. Stores keyboard characters that MTP has not yet read. If you overfill the type-ahead buffer, the excess characters are discarded. The size of the type-ahead buffer is usually 128 characters, but can be changed at system build.

Unprotected Field. Designed to receive data in a form. Also see Field, Form, and Protected Field.

Window. A visible portion of display memory that is shown on the screen below the Status Frame. Also see Screen and Status Frame.

X.25 Protocol. Specifies the rules for communicating over a Public Data Network.

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